

United States Environmental Protection Agency
Washington, DC 20460**Work Assignment**Work Assignment Number
3-1☒ Original ☐ Amendment Number:Contract Number
EP-W-08-018Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and EnhancementContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out
☐ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment CeilingContract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee

LOE

This Action

\$0.00

14500

Total

\$0.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

Branch/Mail Code

ELLIOT R. LIEBERMAN

Phone Number

(Signature)

(Date)

Fax Number

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

(Signature)

(Date)

Fax Number

Other Agency Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contracting Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

WORK ASSIGNMENT STATEMENT OF WORK

Title: IPM Architecture Maintenance and Enhancement

Contractor and Contract #: EP-W-08-018 (ICF)

Work Assignment #: WA 3-1

Estimated Level of Effort: 14,500

Depending on the Government's funding situation, the Government will raise the authorized LOE in periodic increments up to the full 14,500 hours. Upon approval of the Contractor's submitted work plan, the Government will include the initial authorized LOE.

EPA Key Personnel:

Work Assignment Manager (WAM):

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Contract Specialist
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I. BACKGROUND AND PURPOSE

Electric power plants are a significant source of sulfur dioxide (SO₂), nitrogen oxides (NO_x), mercury (Hg), hydrogen chloride (HCl) and carbon dioxide (CO₂) emissions and thus affect a number of air pollution issues.

To evaluate alternative strategies for reducing air emissions from electric power plants,

EPA uses the Integrated Planning Model (IPM), a model of the U.S. electric power sector developed and maintained by ICF Consulting, Inc.. To keep its IPM based projections current, EPA must continually update assumptions that drive this model and expand the model's analytical capabilities. The EPA Base Case assumptions were developed under Work Assignment Nos. 02AA-13, 03AA-13, 04AA-28, and 05AA-28 (Contract No. 68-W6-0049) and updated and enhanced under Task Order Nos. 10, 15, and 31, (Contract No. 68-D7-0081), Work Assignment Nos. 1-3, 2-3, 3-3, and 4-3 (Contract No. 68-W-03-028), and Work Assignment Nos. 0-1, 1-1, and 2-1 (Contract No. EP-W-08-018).

During the previous option period EPA's latest IPM Base Case (designated v.4.10) was made operational and used to model EPA's Proposed Transport Rule and the Proposed Toxics Rule. V.4.10 outputs and documentation were released on the web. Public comment on model outputs was taken (for the Transport Rule) and are pending (for the Toxics Rule).

Among the primary purposes of the current Option Period 3 Work Assignment will be to incorporate changes into the model resulting from the public comments and to debug, quality assure, and make operational the revised IPM v.4.10 base case so that it can be used to perform modeling for the final Transport and final Toxics Rules. In conjunction with this work, peer review and quality assurance of the v.4.10 base case will also be performed. At the same time, the next update of EPA's IPM Base Case (designated v.4.11) will be developed with an anticipated release in the summer/fall 2011. Preparatory work will also be initiated on a major update of the generating unit inventory which is a fundamental input to the model. The revised inventory will be used in the EPA IPM Base Case (designated v.4.12) that the EPA anticipates will be released in Option Period 4.

The current Option Period III work assignment also includes activities to improve the model's reporting capabilities, speed up model run time, perform diagnostic runs, validation exercises, and coordinated modeling (e.g., with EIA's National Energy Modeling System - NEMS), support comparative modeling exercises (like those sponsored by Stanford University's Energy Modeling Forum), develop non-U.S. modules (e.g., an IPM Mexico and/or IPM China modules), bring to completion Option Period 2 activities to incorporate demand side energy efficiency modeling capabilities in EPA's base case, perform coordinated analysis with related electric sector models (e.g., retail pricing model, GEMap transmission model), and improve IPM outputs used as inputs to EPA's air quality models.

None of the work performed under this work assignment will duplicate work performed under previous work assignments or task orders.

II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this work assignment are consistent with the provisions of Attachment No. 1 (Statement of Work) for Contract No. EP-W-08-018.

III. STATEMENT OF WORK TASKS

Task 1— Prepare Work Plan: In accordance with the terms and conditions of contract clause B.2 entitled "Work Assignments" and the section of Contract Attachment No. 1 entitled "Preparation and Submission of Work Plans," the Contractor shall prepare a Work Plan for 14,500 hours. The Government reserves the right not to continue this task beyond the LOE authorized in previously approved amendments.

Deliverables shall be completed and submitted to EPA/OAR/OAP/CAMD as specified in this work assignment, except to the extent that content and dates are changed through the initiation or full agreement of EPA/OAR/OAP/CAMD. The contractor may use the results obtained from, but not duplicate services provided under Work Assignment Nos. 0-1, 1-1, and 2-1 under Contract No. EP-W-08-018 and related work assignments under previous contracts.

Note: If development work on non-U.S. IPM modules are performed under the tasks below, the contractor upon request from EPA shall report total monthly and cumulative hours separately for IPM U.S. and the non-U.S in the contractor's standard monthly report.

Task 2 — Design, Programming, Testing, and Implementation of Selected Updates and Enhancements of IPM

The Contractor shall update selected internal parameters and capabilities of the Integrated Planning Model and EPA Base Case assumptions to ensure that model results are based on the most recent input data. The WAM will specify in technical direction (TD) the particular functional areas to be updated. These functional areas include updating the NEEDS (National Electric Energy Data System) database of existing and planned electric generating units, updating the cost and performance assumptions of new electric generating, and emission control technologies, fuel cost and supply assumptions, emission and heat rate assumptions, power system operation assumptions, Federal and state environmental and renewable energy regulations, financial assumptions, and run year assumptions.

For selected functional areas and at the direction of the WAM, the Contractor shall prepare a typed 5-15 page issue paper that will include the description of the parameters and capabilities to be updated, the policy and technical issues to be resolved, and the sources of data for the update.

Based on the WAM's review, feedback and TD authorizing the implementation of the update, the Contractor shall design and implement the update. The Contractor shall

provide the WAM with interim deliverables adequate to monitor the progress of these activities. At the time of initial testing and immediately before deployment of the functional improvements, the Contractor shall provide the WAM with input (e.g., DAT and EMS files) and output report files (e.g., RPT and RPE files) demonstrating the capabilities of the improvements.

For the purposes of budgeting, the Contractor shall assume that the WAM will request 6-8 issue papers on functional areas identified by the WAM. The WAM will review the issue papers, provide feedback and issue technical direction authorizing implementation. The Contractor shall design and implement the approved changes and test them. Once debugging is completed, the Contractor shall provide the WAM with interim deliverables to monitor progress of activities, including suitable IPM input and output files.

Under this task, the Contractor shall also revise and enhance the NEEDS Comment Input Tracking Tool previously developed and enhanced under Work Assignment Nos. 3-3 and 4-3 (Contract No. 68-W-03-028) and Work Assignment Nos. 0-1 and 1-1 (Contract No. EP-W-08-018). The purpose of the tool is to enable the Contractor, EPA, and others to update the NEEDS database on an ongoing basis, track and screen proposed updates, and generate interim versions of the database between releases of EPA base cases. The Contractor shall propose revisions for EPA review and shall implement revisions selected by EPA. For purposes of budgeting the Contractor shall assume that two rounds of such revisions will be required.

Task 3 — Model Enhancements to Support Analysis of New Environmental Initiatives:

The Contractor shall prepare three 10-20 page technical memoranda for 3-5 model enhancements identified by the WAM. Each memorandum shall cover one of more of the following areas as identified by the WAM: model enhancement option assessments and recommendations, technical specification development, implementation proposals, and areas affecting model realization. Topics will be defined in Technical Direction issued by the WAM. Possible topics under this work assignment include the capability to model particulate matter (PM) emissions directly within IPM, improvements to reduce the model size currently required to model bonus allowance options for CCS technologies (so that a single model plant to choose multiple bonus allowance ratios), revamping the IPM coal transportation matrix to improve the ability to calibrate boiler level fuel use to recent history, options for correcting previously identified weaknesses in the ORL file, and coordinated accounting of water and waste disposal impacts of electric power generation. The WAM will review the technical memoranda prepared by the Contractor, provide feedback to resolve technical and policy issues, and issue TD authorizing programming to implement selected enhancements. The Contractor shall implement the selected enhancements and provide the WAM with interim deliverables (i.e., diagnostic runs), which will be used to monitor progress and obtain feedback from the WAM on further alterations that are necessary before the improvements are fully deployed.

Following up on activities initiated under Work Assignment Nos. 0-1, 1-1, and 2-1 (Contract No. EP-W-08-018), the Contractor shall continue to provide technical support for information exchanges with the National Renewable Energy Laboratory (NREL) aimed at developing possible improvements for modeling renewables in IPM, including possible improvements to input data files. For purposes of budgeting the Contractor shall plan to participate in 6 one-hour telephone meetings and 2 two-hour onsite meetings at EPA's offices in Washington, D.C.

Task 4 — Reporting Improvements

The Contractor shall work with the WAM and EPA analysts on an ongoing basis to identify, develop, and implement new reporting improvements. The Contractor shall obtain feedback on the shortcomings in the current IPM reports and develop prototypes to remedy the shortcomings and provide additional capabilities. For purposes of budgeting, the Contractor shall assume that three prototypes will be required. Each prototype will contain output data from a real IPM run to be selected by the WAM and will represent a complete illustration of the improved reporting capability. The Contractor shall consult with the WAM about the format of the prototype, which could possibly include a report, data files, software application, or a combination these formats.

Based on comments from EPA staff, the Contractor shall prepare final operational versions of the new reporting prototypes and incorporate them into the standard outputs provided to EPA on all subsequent model runs. Before delivery to EPA the prototypes will be fully tested, debugged, and quality assured to eliminate errors and ensure operability.

Following up on work initiated under Work Assignment No. 2-1 under this contract, the Contractor shall work with EPA technical staff to define, design, program, and make operational new detailed outputs from the IPM Gas Market Module for delivery with every IPM run. The Contractor shall provide technical support to automate previously developed manual procedures for passing IPM outputs to and receive inputs from economy-wide and energy-sector-wide models (like the Energy Information Administration's National Energy Modeling System (NEMS) model) and the Applied Dynamic Analysis of the Global Economy (ADAGE) computable general equilibrium (CGE) model. These technical support activities shall include providing input and output files from previously performed model runs and participation in 10 one-hour telephone meetings on topics related to this project.

Task 5 — Parsing and Post-Processing Tool Improvement

The Contractor shall update and make further improvements to the tool used to parse the aggregated model results at the model plant level to the individual generating unit level, with the goal of improving the clarity, consistency, and usability of the resulting output files.

The Contractor shall also propose and develop further enhancements to the post-processing software which generates parameter values required for air quality modeling. The Contractor shall prepare a 5-10 page memorandum describing options and a proposed approach. The WAM will provide technical direction on the approach that will be implemented. The Contractor shall initiate the update and provide the WAM with interim deliverables sufficient to monitor progress.

The Contractor shall provide technical support to address parsing and post-processing issues that were not resolved under previous Work Assignments.

Task 6 — Validation Evaluations

Under this task, the Contractor shall perform validation exercises that address limitations identified in previous validation exercises and that follow up on comments obtained in the peer review performed under previous work assignments. The Contractor shall identify the issues identified but not addressed in the previous validation exercises and propose approaches to be used to address them in the current validation exercise. After review, revision, and authorization to proceed by the WAM, the Contractor shall carry out the validation activities. The Contractor shall provide the WAM with interim deliverables adequate to monitor the progress of these activities, including input (e.g., DAT and EMS files) and output report files (e.g., RPT and RPE files) from the IPM validation runs. On completion of this validation exercise, the Contractor shall deliver a 5-15 page technical memorandum containing a detailed description of the data that was used, the procedures that were performed, and the results that were obtained. The contractor shall also deliver data files and model input and output files from the IPM runs that were used in the validation.

Task 7 — Documentation

Under Option Period 2 work assignment WA 2-1 the contractor developed the natural gas market module (GMM) which was incorporated in EPA Base Case v.4.10. The contractor prepared documentation on the GMM data assumptions and conceptual underpinnings. Under the current Option Period 3 work assignment the contractor shall document the technical linear programming implementation of GMM in IPM with the purpose of providing EPA technical staff with a clearer understanding of the functional representation of the gas market, decision (independent and dependent) and state variables, coefficients, right-hand-side values, operators and other key parameters. The purpose of this technical documentation is to increase EPA's understanding of the workings of the module, reveal additional information and insights that the module could provide, and identify capabilities that could be enhanced.

The Contractor shall provide tables, figures, and limited text needed to enable EPA to prepare documentation reports for base cases prepared under this Statement of Work.

This will involve preparing an outline for the full report and identifying the tables, figures, text, and other items to be developed by the Contractor. Besides providing

comprehensive documentation for the types of assumptions covered under previous base cases, the Contractor shall give particular attention to documenting assumptions that were not included in documentation for previous base cases and to correcting assumptions that were inadequately or wrongly documented in these previous base cases. In this regard, the contractor shall prepare a 5-15 page technical memorandum listing new assumptions that need to be documented and previous assumptions that need to be revised, enhanced or corrected. For each new and revised assumption the technical memorandum shall specify the form that the documentation will assume (i.e., tables, figures, maps, text, etc.).

Using the materials provided by the Contractor, EPA will draft the report. The Contractor shall review and provide comments (using redline and strikeout in an electronic version of the draft report) for two revisions of the initial draft report. For purposes of budgeting, the Contractor shall assume that documentation reports prepared under this Statement of Work will be comparable in length and content to "Documentation for EPA Base Case v.4.10 Using the Integrated Planning Model" (August 2010), which was prepared by EPA and the Contractor following a similar procedure. This documentation can be found on the web at www.epa.gov/airmarkets/progsregs/epa-ipm/BaseCasev410.html.

The Contractor shall provide a complete set of documentation items (i.e., tables, figures, and limited text) for EPA Base Case v.4.11 and for revisions to EPA Base Case v.4.10 resulting from comments on the proposed and final Transport and Toxics rules. For purposes of budgeting the Contractor shall assume that the v.4.11 documentation materials required under this Work Assignment shall be on a scale comparable to the complete documentation for Base Case v.4.10 that was prepared under Work Assignment No. 2-1, whereas the documentation for the v.4.10 revisions shall consist of a limited number of additional items (i.e., no more than 50) beyond those previously provided under Work Assignment No. 2-1.

Task 8 — Model Size and Speed Assessment and Upgrade

The Contractor shall conduct ongoing assessments of available hardware and software upgrades required to keep model run time under 8 hours for all variants of IPM developed under this Work Assignment including an IPM variant that includes more than 6 model run years; a single pass capability to represent demand response; a full array of generating technologies; emission control retrofits for SO₂, NO_x, CO₂, Hg, HCl and other HAPs; national, multi-national, regional, and state emissions regulations; trading, banking, and bonus allowance capabilities; and coverage of the entire North American power market (U.S., Canada, and Mexico).

Every 3 months or as requested by the WAM, the Contractor shall identify various hardware and software options that could help meet EPA's proposed run specifications. The Contractor shall also assess each of the identified options with respect to estimated run time provided by the option, time required to implement, start-up and ongoing cost to deploy, and pros and cons of the alternative. Based on the WAM's direction, the Contractor shall select an option(s) that could bring run time within the

8-hour limit. The Contractor shall implement and deploy the chosen option with a view to make it operational within 3 months of the choice of the option.

The Contractor shall also continue to provide technical support in the periodic effort to perform IPM runs on supercomputers at EPA's National Environmental Supercomputer Center or other computing facilities. The effort would involve the Contractor using IPM to generate standard MPS (Mathematical Programming Software) files that can be run on the designated supercomputer. The Contractor shall participate in periodic teleconferences (not to exceed one two-hour teleconference per month) to evaluate supercomputer performance and address problems that may arise. (Note: Performance of this activity is contingent on EPA's establishing the appropriate license agreements with the Supercomputer Center or other facilities.)

Task 9 — Performing Model Runs

The contractor shall perform 40 diagnostic IPM runs in the course of preparing the base cases through the activities described above in Task Nos. 2-4. For each model run, the Contractor shall provide the WAM with run specifications, input (e.g., DAT and EMS files) and output report files (e.g., System Summary Reports, RPT and RPE files)

Task 10 — Parsing and Post-Processing Results from Model Runs

For diagnostic purposes, the Contractor shall perform 6 parsings and post-processings of IPM run outputs produced under Task No. 9. The WAM will identify the runs and run years to be used. The Contractor shall deliver the parsed and ORL (one record line) files within 3 working days after a request to proceed.

Task 11 — Expert Panels, Work Groups, and Special Studies

The Contractor shall propose nationally and internationally recognized experts beyond the contractor's immediate staff, to develop assumptions for incorporation in future EPA base cases on up to 5 topic areas to be identified by the WAM. Possible topic areas include, but are not limited to the following:

- (a) Developing nuclear fuel supply curves needed for modeling out to 2070.
- (b) Developing smart grid scenarios and procedures for their inclusion in IPM runs.
- (c) Identifying power sector impacts on environmental media besides air and procedures for their representation in IPM.
- (d) Providing data to improve the representation of existing and planned/committed generating units in Alaska, Hawaii, Virgin Islands and Puerto Rico.
- (e) Developing specifications for new generation technologies and emission controls not currently included in EPA's IPM base case.

The proposed experts shall have

- Demonstrated expertise, 10+ years of professional experience, and recognized standing in the respective topic areas.

- Access to data and other information necessary to prepare the inputs required for IPM.
- Clearance to publicly release all data and other assumptions used in a future EPA base case and to prepare documentation fully describing data sources and the basis for the assumptions used in that base case.
- Availability to prepare materials and make presentations at expert peer review sessions on assumptions incorporated in the base case.

For each topic area the contractor shall

- Draft technical specifications describing the issues and questions to be addressed by the experts.
- Identify candidates with the requisite expertise.
- Provide the WAM with estimates of the cost, level of effort, and delivery schedules for the activities to be performed by outside experts.

EPA will review and determine whether to proceed with the Contractor's proposal. If the decision is to proceed, the Contractor shall put in place the procedures necessary to secure the identified experts and perform the work. In addition, the Contractor shall

- Provide technical support to enable EPA to review and provide feedback as the input assumptions are developed.
- Ensure that all the inputs necessary for IPM are obtained.
- Obtain data and documentation required for public release and peer review.

Task 12 — Technical Support for Peer Review of IPM

The Contractor shall provide technical support for independent expert review of IPM assumptions, methodology and outputs. Under this work assignment, the Contractor shall complete response documents for peer reviews that were conducted under previous work assignments under Contract No. EP-W-08-018 and prepare and participate in up to two new peer reviews of key assumptions in the v.4.10 and v.4.11 base cases. The specific topics of these peer review will be identified by the WAM.

For each peer review, the Contractor shall prepare and disseminate documents for review, make presentations (approximately 40 slides or overheads each) at one (1) 4-6 hour peer review meeting in Washington, DC or two 2-hour sessions by phone and/or the internet, participate in two 1-2 hour preparatory telephone meetings and two (1) 1-2 hour post-peer-review telephone meetings, collect and summarize comments, and draft a 20-30 page response document. The EPA publication "Peer Review Handbook, 3rd Edition," EPA/100/B-06/002, January 31, 2006 (www.epa.gov/peerreview/pdfs/peer_review_policy_and_memo.pdf) and associated guidance documents shall be used as guidance for this task.

Task 13 — Quality Assurance and Quality Control Activities

Under this task, the Contractor shall report at regular intervals (no less frequently than month) on activities being undertaken to demonstrate adherence to the Quality

Assurance Project Plan for EPA Applications of IPM (the "QAPP"). Ten months after the start of this Work Assignment, the Contractor shall provide a 5-10 page technical memorandum documenting all the activities performed during the current work assignment to demonstrate that the procedures and criteria contained in the QAPP are being followed, including quality control procedures for data gathering and analysis and evaluation criteria for data sources and estimation methodologies. QC procedures may include file documentation and data checks, and forms to ensure that appropriate methodologies and assumptions are used.

Task 14 — Conferences and Comparative Modeling Workshops

The Contractor shall provide one staff member to participate in one conference and in one comparative modeling workshop chosen by the WAM. This activity has a twofold purpose: (a) to make presentations on IPM, its inputs, and/or related models (e.g., retail pricing model) and (b) to obtain information relevant to updating and improving IPM and related models. The Contractor shall develop one presentation (consisting of approximately 40 slides) for delivery at the conference and another for presentation at the comparative modeling workshop. For purposes of budgeting, the Contractor shall assume that the conference and workshop are each three days in duration and in a location on the U.S. West coast.

IV. DELIVERABLES

During the course of this work assignment the contractor shall participate by phone in weekly Architecture Status Meetings, 1-2 hours in length.

Note: All electronic deliverables required under this work assignment shall be emailed to the WAM and/or posted on the contractor's FTP site for downloading. The contractor shall also provide electronic versions of all deliverables on CD-ROM disks at the conclusion of the work assignment. The disk(s) will be accompanied by a hardcopy index of all items contained on the disk(s).

Task 1: Work Plan

In accordance with clauses B.2 and Attachment No. 1 of the contract

Task 2: Design, programming, testing and implementation of selected updates and enhancements of IPM

Six (6) to eight (8) 5-15 page issue papers	3 weeks from request to proceed
Input and output files from 6-8 diagnostic runs	4 weeks from request to proceed
NEEDS Comment Tracking	4 weeks from request to proceed

Tool - Round 1 Revision

NEEDS Comment Tracking
Tool - Round 2 Revision

4 weeks from request to proceed

Task 3: Model Enhancements to Support Analysis of New Environmental Initiatives

Three (3) to five (5) 10-20 page technical memorandum

3 weeks from request to proceed

Input and output files from 3-5 diagnostic runs

4 weeks from request to proceed

Specifications and sample data files for information exchange with NREL

2 weeks from request to proceed

Task 4: Reporting Improvements

3 draft reporting improvement prototypes

5 weeks from request to proceed

3 operational reporting improvement prototypes

8 weeks after obtaining feedback on draft prototypes

Input and output files from previously performed IPM runs (to be used in EPA's research on advanced decision making tools)

1 week from request to proceed

5-10 model runs and accompanying data files for testing data exchange and coordinated modeling with IPM and NEMS

1 week from request to proceed for each trial run

Task 5: Parsing and Post-Processing Tool Improvements

Two (2) 5-10 page technical memoranda. (1 covering improvements to the parsing procedure; the other covering enhancements to the post-processing procedure)

4 weeks from request to proceed

Parsed output files from 2 diagnostic runs

4 weeks from request to proceed

2 draft and 1 final one record line (ORL) post-processing output files

6, 8, and 10 weeks from request to proceed respectively

Task 6: Validation and Uncertainty Evaluations

Input and output files from
validation runs

4 weeks from EPA approval of
validation proposal

One (1) technical memorandum (5-15 pages)
summarizing results of validation

3 weeks from completion
of validation runs

Task 7: Documentation

(Note: The following activities will be performed in their entirety for one full documentation report required under this work assignment. In addition, selective activities will be performed as required to bring to completion documentation begun in the previous option period for the base case scheduled to be released in Spring 2010).

Draft and final outline for the GMM
technical documentation

1 week (draft) and 2 weeks (final)
from request to proceed

Draft GMM technical documentation report

6 weeks from request to proceed

Final GMM technical documentation report

2 weeks from request to proceed

Draft outline of v.4.11 report and appendices

2 weeks from request to proceed

Final outline of v.4.11 report and appendices

2 weeks after receiving feedback
on draft outline

5-15 page technical memorandum on
new and revised assumptions and how
they will be documented

2 weeks from request to proceed

Tables, figures and limited text for v.4.10
and v.4.11 documentation report

Ongoing for 6-12 weeks after
finalizing outline

First and second mark-ups of draft v.4.10
and v.4.11 documentation reports

2 weeks from receipt of each
draft report

Task 8: Model Size and Speed Assessment and Upgrade

Telephone briefings on available options

Every 3 months by phone as part
of Architecture Status meetings

Implementation of size and speed
improvements.

Every 6 months

Task 9: Performing Model Runs

Specification for each of 40 runs

1 day from request to proceed

Input and output files and updated run log
for each of 40 model runs

3 days from request to proceed

Task 10: Parsing results from model runs

Spreadsheet files containing fully quality assured,
parsed results for 6 parsings of IPM output files

3 days after request to proceed

Task 11: Expert Panels, Work Groups, and Special Studies

The following shall be prepared for up to 5 technical topic areas:

Draft and final technical specifications on issues
and questions to be addressed by experts

3 weeks from request to proceed

List of candidates with required expertise

3 weeks from request to proceed

Estimate of cost, level of effort, and
delivery schedule

3 weeks from request to proceed

Data and other information required
for incorporation in IPM

4 weeks from request to proceed

Data and documentation required for
public release and peer review

6 weeks from request to proceed

Task 12: Technical Support for Peer Review of IPM

3 presentations (approximately 40 slides
or overheads each)

3 weeks from request to proceed

3 summaries of comments
(10-20 pages each)

1 week after each peer review
meeting

3 response documents (20-30 pages each)

2 weeks after each peer review
meeting

Task 13: Quality Assurance and Control Activities

Summary of QA/QC activities performed

Monthly by phone as part of
Architecture Status meetings

5-15 page technical memorandum

10 months from inception of this
Work Assignment

Task 14: Conferences and Comparative Modeling Workshops

2 presentations (each consisting of
approximately 40 slides)

3 weeks after request to proceed

Three (3) 1-2 page response to questions on
previously performed model runs

3 days from request to proceed

1-2 addition model runs

1 week from request to proceed

United States Environmental Protection Agency
Washington, DC 20460**Work Assignment**Work Assignment Number
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☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to add Gene-Hua Sun as Alternate Work Assignment Manager.

Gene-Hua Sun
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Washington, DC 20460
202-343-9119
sun.gene-hua@epa.gov☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

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Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12

Cost/Fee

LOE

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14500

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Work Plan / Cost Estimate Approvals

Contractor WP Dated :

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LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-1

☐ Original ☒ Amendment Number: 2

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and Enhancement

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated March 31, 2011.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$0.00

LOE
14500

This Action

\$2,052,950.00

0

Total

\$2,052,950.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Cumulative Approved: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-1

☐ Original ☒ Amendment Number: 3

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and Enhancement

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to set an interim Cost/Fee ceiling of \$1,021,653.00 and an interim LOE ceiling of 7,216 hours. The contractor shall not exceed these ceilings without the written approval of the Contracting Officer.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$2,052,950.00

LOE
14500

This Action

\$0.00

0

Total

\$2,052,950.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Cumulative Approved: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Work Assignment Manager Name

Branch/Mail Code

ELLIOT R. LIEBERMAN

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number

3-1

☐ Original ☒ Amendment Number: 4

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and Enhancement

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to raise the interim Cost/Fee Ceiling to \$1,271,653.00 and the interim LOE ceiling to 8,981 hours.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$2,052,950.00

LOE
14500

This Action

\$0.00

0

Total

\$2,052,950.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Cumulative Approved: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contracting Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-1

☐ Original ☒ Amendment Number: 5

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and Enhancement

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to raise the interim Cost/Fee Ceiling to \$1,371,653.00 and the interim LOE ceiling to 9,686 hours. The contractor shall not exceed these ceilings without the written consent of the Contracting Officer.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$2,052,950.00

LOE
14500

This Action

\$0.00

0

Total

\$2,052,950.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Cumulative Approved: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Work Assignment Manager Name

ELLIOT R. LIEBERMAN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

RACHEL SCHWARTZ

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

Contracting Official Name

RACHEL SCHWARTZ

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-1

☐ Original ☒ Amendment Number: 6

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
IPM Architecture Maintenance and Enhancement

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to change the Work Assignment Manager to Serpil Kayin. She may be reached at kayin.serpil@epa.gov.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$2,052,950.00

LOE
14500

This Action

\$0.00

0

Total

\$2,052,950.00

14500

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Cumulative Approved: 03/31/11

Cost/Fee: \$2,052,950.00

LOE: 14500

Work Assignment Manager Name

Branch/Mail Code

Phone Number 202-343-9390

Fax Number

(Signature)

(Date)

Project Officer Name

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

Branch/Mail Code 3803R

Phone Number 202-564-6476

Fax Number

(Signature)

(Date)

Contracting Official Name

Branch/Mail Code 3803R

Phone Number 202-564-6476

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

1/4/12

United States Environmental Protection Agency
Washington, DC 20460**Work Assignment**Work Assignment Number
3-2☒ Original ☐ Amendment Number:Contract Number
EP-W-08-018Contract Period
Base

Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development ActivitiesContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out
☐ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 5)	Budget Org/Code (Max 7)	Program Element (Max 5)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment CeilingContract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee

LOE

This Action

\$0.00

9000

Total

\$0.00

9000

Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

GENE-HUA SUN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

WORK ASSIGNMENT STATEMENT OF WORK

Title: Technical Support for Clean Air Markets Division Regulatory Development Activities

Contractor and Contract #: EP-W-08-018

Work Assignment #: 3-2

Estimated Level of Effort: 9000

Duration: March 11, 2011 – March 10, 2012

EPA Key Personnel:

Work Assignment Manager (WAM):

Gene-Hua Sun
USEPA/OAR/OAP/CAMD/PDB, 6204J
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Phone: (202)343-9119
Fax: (202)343-2359
E-Mail: Sun.Gene-Hua@epa.gov

Contracting Specialist:

Ryan Daniels
1200 Pennsylvania Avenue, NW
Washington, DC 20460
Mail Code 3803 R
Phone: (202) 564-6476
Fax: (202) 565-2558
E-mail: Daniels.Ryan@epa.gov

I. BACKGROUND AND PURPOSE

This is the continuous effort, starting from Work Assignment 0-3, 1-3 and 2-2 of this contract, to acquire the technical support for CAMD/EPA regulatory development activities. Under this work assignment, the contractor shall use the developed "Integrated Planning Model (IPM) Version 4.0, 4.1 and/or newer version to support CAMD regulatory development activities by estimating the operational costs, by estimating emission reductions, and by providing the technical analyses for the economic impacts to the electric power generating sector and users for current regulatory development under the multiple pollutant control strategy. Activities covered in this work assignment include modeling, analyses, and assessment in support of policy development, rulemaking, and impact evaluations related to power generation and other

stationary sources, energy consumption, and the pollutants associated with the power sector and other stationary sources, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM_{2.5}), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO₂) and other greenhouse gases. Activities may be related to the development of the Replacement of Clean Air Interstate Rule (CAIR), and/or the proposal of air toxics standards for coal- and oil- fired electric generating units and finalize the rule under Clean Air Mercury Rule (CAMR), New Source Performance Standards (NSPS), New Source Review (NSR), Maximum Achievable Control Technology (MACT), or other regulatory actions, policy development, or legislative proposals."

Additionally, regulatory support activities also include work related to air quality improvement (NAAQS Review, State Implementation Plans (SIPs), air toxics (MACT reviews), and greenhouse gases (e.g., Federal voluntary programs to lower GHGs and development of cleaner technology, while States begin to address GHGs (e.g. RGGI, California, etc.) and Congress considers legislation (e.g., implementation of mandatory emissions reporting, Senate and House developing comprehensive legislation, etc.)).

In the past, air emissions from the power sector were regulated one pollutant at a time and the regulations were developed under various authorities. Industry has developed and implemented control technologies in incremental steps to mitigate emissions of SO₂, NO_x, particulate matter, and other pollutants, as driven by air pollution policies and regulations. Experience with the interactive effects of previous regulatory approaches, a better understanding of control technology synergies, growing knowledge about the co-benefits of controlling various combinations of pollutants, as well as the growing concern over the continuing environmental impacts of the power generating sector have lead to proposals for integrated approaches to control air emissions from the power generating sector. Most of these integrated approaches include the control of SO₂, NO_x and Hg emissions. Some of the multi-pollutant control technologies have reached a stage of development beyond pilot scale. Included are those technologies that integrate during- and/or post-combustion controls of at least two of the SO₂, NO_x, mercury pollutants, and CO₂ emissions, either in one process or a combination of coordinated and complementary processes. Some of the new coal-fired electricity-generating technologies, which are inherently more efficient than conventional coal-fired power plants, have the potential to generate lower emission of air pollutants and CO₂.

On July 6, 2010, EPA proposed Transport Rule that would significantly reduce emissions that contribute to fine particle and ozone pollution in the eastern United States. Beginning August 2, 2010, EPA held three public hearings on this proposed rule. On September 1, 2010, EPA announced a Notice of Data Availability Supporting Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone. On October 27, 2010, EPA made emissions inventories data supporting the proposed transport rule available for review. On January 7, 2011, EPA issued a NODA for "Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone: Request for comment on Alternative Allocations, Calculation of Assurance Provisions Allowance Surrender Requirements, New-Unit Allocations in Indian Country and Allocations by States." EPA intends to finalize this proposed rule as soon as possible to provide certainty for sources and states that emissions reductions will continue and that greater needed reductions will occur in the future. Although this rule gets larger emission reductions accomplished more quickly than CAIR required, additional emissions

reductions will be needed to help states attain current and future air quality standards. EPA has begun the work necessary to apply this proposed template to the 2010 ozone standard. The Agency plans to propose that standard in 2011 and finalize it in 2012.

Under this work assignment, the contractor shall:

- (1) Provide the technical and economic studies under the criteria established by the Work Assignment Contract Officer's Representative (WAM) and CAMD technical staff to support routine EPA rule making processes;
- (2) Evaluate the operational cost and effects among the installed Air Pollutants Control Devices (APCDs), combustor efficiency improvement and its co-benefits on CO₂ reductions, and economic impacts under proposed multi-pollutant reduction rules for fossil fuel fired electric generating units;
- (3) Assess the feasibility and reliability of installing air pollution control technologies for proposed rules in the electric power generating sector under given time frames;
- (4) Assess the uncertainties associated with major parameters used in the IPM model to support CAMD regulatory development activities; and
- (5) Assist the administration in preparing white papers and Microsoft Power Point related slide presentations in answering Congressional and inter-agency demand and public comments related to the products generated from this work assignment.

II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this work assignment are consistent with the areas of analyses authorized in sections A through I of the contract's Statement of Work:

III. STATEMENT OF WORK TASKS

TASK 1: Prepare Work Plan

The Contractor shall prepare a work plan in accordance with the terms of the contract. However, the Government will fund this work assignment in five stages, pending the availability of funds in each stage and the technical support required at that particular time. The contractor may not exceed the interim ceilings without written approval of the Contracting Officer. The initial LOE ceiling for the first stage will be 1,800 hours. Deliverables shall be completed and submitted to EPA/OAR/OAP/CAMD as specified in this work assignment, except to the extent that content or dates are changed through the initiation or full agreement of EPA/OAR/OAP/CAMD. The contractor may use the results obtained from, but not duplicate services provided under Work Assignment Nos. 0-3, 1-3, 2-2 and work assignments from the previous ICF CAMD Mission

Support contract.

The contractor shall expect to provide ad-hoc responses for not more than 35% of the LOE involvement. The contractor shall realize that the allocation of effort required under each work area under this work assignment may vary during actual performance. The contractor shall work closely with the WAM through the course of this work assignment to ensure the best of use of LOE under limited funds available. The contractor shall notify the WAM when 90% of the work assignment hours or approved funding level has been accumulated in contractor's accounting system.

TASK 2: Regulation Compliance Costs Analysis to support CAMD/PDB for various Rule Making Processes

The Contractor shall use the Integrated Planning Model (IPM) version 4.0, 4.1 and/or newer version in planning to estimate the national, regional and state compliance costs for the emission reductions established through various multipollutant reduction regulations as specified in the background section. The Agency estimates up to 80 IPM runs will be needed to support one year of the CAMD rule making procedures under this work assignment. The contractor shall expect to parse up to 25 % of these runs (i.e. up to 20 IPM runs) for detailed boiler level information to support EPA's technical studies. The WAM will issue written requests for runs which need to be parsed when specific needs have been identified thru the work assignment order durations. These 80 IPM runs will be used to address the following specific areas:

1. Routine studies: Based on the emission caps established in different regulations and the newly available control cost information acquired during the course of this work assignment, CAMD will need specific IPM runs (e.g. under IPM version 4.0, 4.1 and/or newer version depending on the purpose of the study and the reference base case used for that study) to support CAMD technical studies in order to address issues related to policy development, economic impact assessment, interrogatories from inter- and/or intra-agency effort in rule development, responses to comments from Congressional committees and/or other environmental organizations, and the litigation of the regulations involved with CAMD regulatory development activities, (e.g., CAIR and/or CAMR and its Reconsideration(s)). The Agency also needs to conduct sensitivity, reliability, and feasibility studies for the electric power generating system in installing and/or retrofitting air pollution control devices available in the market for the electric power generating industry to use in compliance with air pollutant reduction regulations. The WAM estimates that 30 IPM runs under this work assignment will be needed to address these routine studies. For routine analyses, the contractor shall deliver the study results from these IPM runs to the agency three weeks after receiving the written notice from the WAM. The contractor shall expect that 25% of these routine IPM runs will be issued in an ad-hoc manner. Results from ad-hoc runs should be delivered to the WAM within three days after receiving the WAM's written requests. For each IPM run, the WAM will work with CAMD technical staff to determine the input data criteria (i.e., allowable options, limiting parameters, reference base case or policy cases identification, emission caps, and specific constraints) for each IPM model run. These criteria and parameters will be generated based on: (1) The economic analyses needed to examine regulatory

options, (2) Comments which the Agency received during the course of this work assignment, or (3) New information received during the CAIR and/or CAMR litigation processes. The contractor shall summarize and present to the WAM the run specification by Excel style spreadsheet before each IPM run. Upon receiving the approval from the WAM, the contractor shall perform these IPM runs. The contractor shall deliver results in the electronic and/or hard copy format according to the deliverable schedules specified in the WAM's written request for the ad-hoc runs. For non-ad-hoc IPM runs, deliverables shall be delivered as specified in the deliverables schedules attached at the end of this Statement of Work.

2. Specific studies to support and/or to revise may include "Financial Analysis," "Potential Impacts Upon Employment in Other Economic Sectors," "Continuing Support in the Implementation of the National Energy Policy," "Support for Response to Congressional Requests," "Analysis of Impacts of Carbon Regulations," and "Costs, Performance, and Availability of Applicable NOx and SO2 Control Measures for Existing and New Cement Kilns in the U.S." Details of these analyses will be discussed in Task 3. The WAM estimates that 25% of the IPM runs effort will be used in this category.
3. Studies to support "Analysis of Allowance Allocation Options". More detail of these runs will be discussed in Task 6. The WAM estimates that 15% of the IPM runs will be used to support this category.
4. Potentially 6-12 studies will be required, in which the contractor shall analyze power generation from renewable and/or nuclear as source and its relationship to the overall electric generation. Analysis may include examining the economics of power generation from renewable or nuclear sources, costs associated with these sources, plus the addition parameter such as the status on nuclear re-licensing and/or life extension, and cost and performance of new nuclear generation.
5. Analyses to provide technical support for complimentary rulemakings for the power sector, including the litigation of the CAIR Reconsideration, any possible mercury legislation (which might be related to CAMR or MACT), Best Available Retrofit Technology (BART), and Maximum Achievable Control Technology (MACT) rule would affect such rule development and/or proposed legislation. The remaining portion of IPM runs will be used to support items 4 and 5 of this task.

For items 2 through 5, the WAM will work with the CAMD technical staff to determine the allowable options and limiting parameters for each of the IPM model analyses. These options and parameters will also be generated based on: (1) The economic analyses needed to examine the regulatory option, (2) The specific studies generated from the Congressional request, or (3) Specific benefit analyses required for RIA. The WAM will issue a written request to the contractor to specify these criteria and deliverable schedule. The contractor shall perform these IPM runs and deliver the results (i.e., electronic and/or hard copy) to the WAM as specified in the written request. Other deliverable items not specified in the WAM's written request shall be delivered as specified in the deliverables schedule attached at the end of this Statement of Work.

TASK 3: Technical Analyses and Documents Preparation for Regulatory Impact Analyses Related Rulemaking Processes

The contractor shall, in order to continue the support of the multi-pollutant reduction rule making efforts under CAIR, CAIR Litigation, any mercury rulemaking activities (that may include revisiting aspects of CAMR), NSR, Section 812 for the Title IV of the CAAA and/or CAIR, NSR settlements, NSPS, the Geological Sequestration Rule, and the GHG Inventory Rulemaking, perform the following technical analyses and documentation preparation as may be required by the rule making processes:

1. Financial Analyses: in this area, when needed, the WAM will issue a written request for the contractor to enhance the financial analyses originally developed by ICF in the previous contract (and subsequent work assignment(s)). The enhancement shall include the findings and specific data obtained in new IPM runs for the case studies specified in Task 2 of this Statement of Work. Topics which need to be updated include power plant economic and viability issues, market efficiency studies, and financial distress analyses. The financial analyses shall include the IPM run results which address the results from assumptions of different emissions control levels, alternative control performance, alternative fuel cost, projection of the types of new power plants on line, and alternative financial assumptions. The relationship developed between these new IPM runs and financial studies shall help the Government to determine the potential impacts on retail electricity prices, coal production, employment, and electricity generation at the State, regional and national levels. The contractor shall also provide the results of these studies to help the Agency to determine the financial impacts of the Best Available Retrofit Technology (BART) and Maximum Achievable Control Technology (MACT) to the rule development activities currently in progress.
2. Regarding the feasibility of installing air pollution control technologies, the contractor shall examine the time needed to install controls and the impact on electric reliability. The contractor shall assist the Agency to identify the control technology installations needed to meet the various emission cap levels for SO₂, NO_x and mercury by the expected time frame. Analysis shall examine the affects on the power utility sector reliability and boiler outage period for the installation of control technologies. Such efforts would assist CAMD in analyzing and assessing NO_x, SO₂, and mercury emission control science/testing and their respective parametric cost and performance. After receiving the WAM's written request, the contractor shall provide the WAM with the essential information to identify the hot spots (e.g. regions in the country which are projected to have higher percentages of control technology installations) and the time frame required for electrical power generation sector to install or retrofit these control technologies.
3. In the support of activities such as the response to Congressional, OMB, inter- or intra-agency requests, and comments received during the public comment periods, the contractor shall provide ad-hoc technical analyses to support the EPA in preparation

documentation to respond to Congressional, OMB, and inter- or intra-agency requests for technical evaluation of information. In addition to using the IPM model (e.g. both version 4.0, 4.1 and/or newer version depending to the type of analyses), the contractor shall also first upgrade and use the off-line analysis tools, such as TRUM model which needs to be upgraded under this work assignment to match the IPM version 4.0 assumptions, to perform this sub-task. The contractor shall expect no more than ten (10) studies in this sub-task. When all of them need to be done by TRUM, the contractor shall expect no more than 30% of these TRUM model run results will be requested by the WAM's TD to be verified by full scale of the IPM model run. Draft reports resulting from these quick turn-around operations are due five (5) working days after receiving the WAM's written request. Implementation of a new modeling platform to demonstrate potential air quality benefits available through energy efficiency measures on HEDDs will require 1) enabling IPM to output results at an hourly level, and 2) synchronizing IPM and the air quality modeling platform (CMAQ) in their use of meteorological data and energy demand data, 3) conducting two runs with and without energy efficient measures to analyze reduction in emission levels on HEDD days, and 4) preparing air quality modeling ready files.

4. EPA may chose to undertake analysis related to the costs, performance, and availability of applicable NO_x and SO₂ control measures for existing and new cement kilns in the U.S. Such analysis will be issued to the contractor as a technical direction. Current LOE for this analysis should not exceed 100 hours.

In addition, when performing the analyses specified in items 1, 2, and 3 of this task, the contractor shall identify the impact of these changes to the existing regulatory support documents, including the documentation for the economic analyses (EA), the Small Business Regulatory Enforcement Fairness Act (SBREFA), and the Unfunded Mandates Reform Act (UMRA). The contractor shall summarize and present the differences between the results from these new studies and from the existing regulatory support documents to the WAM. When the differences are significant, the WAM will issue a written request to the contractor clarifying the sections and the contents in these documents which need to be updated to reflect the new study results.

Depending on the significance of new information, the WAM will issue a written request for the documentation specified as above. Upon receiving a written request, the contractor shall prepare the draft update documentation and deliver it to the WAM for review. The contractor shall expect up to two (2) revisions prior to finalization of these documents.

TASK 4: Upgrade the TRUM software and Analysis of Sensitivity of Control Costs for NO_x, SO₂ and Mercury (Hg) Generated Among the Proposed Rules Developed under Multi-pollutant Reduction Technologies

As part of the efforts in collecting control technology information to support the future NEEDS database, the contractor shall work with the WAM through technical direction to provide technical support for collecting and developing algorithms for capital, fixed O&M, and variable O&M costs for existing IGCC facilities and pollution control technologies (e.g., such as wet

ESP, solvent injection, SO₂ control and similar technologies) installed in existing fossil-fueled power generating units. Because of the slow responses from the industry, the WAM recognizes these continuous efforts shall be handled through the full contract period. For the budget purpose, upgraded NEEDS database is only listed as a potential working area. The contractor shall be ready to work on this area when receiving the written notice from WAM when new data becomes available.

The NEEDS database and IPM model version 4.0 and/or newer will reflect the updates from previous IPM and NEEDS versions regarding the model plants (e.g., basic units used in IPM models to group similar characteristics boilers in the sense of the boiler types, fuel uses, allowable emission control device selection, etc.). The TRUM model, a simplified IPM full version, uses a reduced model plants package with limited user choice variables but is capable of representing the full version IPM run with some deviation. This capability can save the Government a lot of computer time and facility requirements (e.g., CPU speed, installed memory size, and hard-disk space). Since the TRUM model is not as powerful as the full version of the IPM, it allows CAMD to do in-house quick and rough evaluations of sensitive issues in the rulemaking process without requiring time consuming full IPM version model runs. An older version of the TRUM model is based on an earlier version of the NEEDS. In order to provide the Government the same level of support, under this work assignment, the contractor shall update the TRUM model based on NEEDS database which support IPM model 4.0 or newer. This updated model should be developed in a stand-alone software manner so it can either be installed and used by CAMD staff when installed in EPA owned equipment, or be installed in a contractor designated and security-cleared machine in the contractor's office with the criteria (such as boundary condition, run years) set by CAMD experts. This option will provide the Government a choice to run this model in the most cost effective way if the Government experiences a manpower shortage during the major data crunch period.

TASK 5: Update IPM Parameters and Capabilities in Support of Sensitivity Study as Specified in Task 2

When needed, the WAM will issue a written request to the contractor to use the results from task 4 to update the IPM parameters and capabilities used in the IPM version 4.0 or newer model. Upon receiving this request, the contractor shall update requested parameters and capabilities of the Integrated Planning Model to ensure that results obtained under Task 2 are technically defensible. The WAM will also specify in the written request the specific functional areas (e.g., installation cost, O&M cost, efficiency, applicability, and reliability) to be updated. For each functional area, the contractor shall prepare a typed issue paper of 15 pages or less which shall include the following information:

- Description of the parameters and capabilities to be updated,
- Identification of policy and technical issues to be resolved,
- Sources of data for the update.

In addition, for each issue paper, the contractor shall include not more than five extra discussion topics which will be clarified by the WAM in the written request for these issue papers.

The WAM and CAMD technical staff will review the issue paper, provide feedback to resolve technical and policy issues, and issue written requests authorizing programming to implement the update. The contractor shall make the programming changes and perform two sets of diagnostic model runs to test the programming changes. The contractor shall provide the WAM with outputs from the diagnostic runs for review and comment.

For budgeting purposes, the contractor shall assume that the WAM will request updates of seven (7) functional areas in preparation for an issue paper in each of the areas, presentation of initial and final run outputs demonstrating achievement of the updated capabilities, and documentation of the updated parameters and capabilities. The delivery schedule for the issue papers, initial and final run outputs, and documentation will be specified by the WAM in the written request.

TASK 6: Allocation Analysis for Multi-pollutants under Cap and Trade Program

Like most of the existing air pollutant emission reduction rules (e.g., Title IV, SIP Call and S-126), CAIR and CAMR rules (both final rule and rule reconsideration) also include the Cap and Trade Program elements. These rules allow States to use the federal operated Cap and Trade Program to support States in compliance with these rules. When implemented, the Federal Government will calculate and allocate the pollutants allowances for each of the existing power generating units based on the heat input data. The Agency will likely need analyses of allocations methods that may include NO_x, SO₂, Hg, or CO₂.

In the rule making and litigation processes, the contractor shall provide analytical support for the evaluation of emission allowance allocation options within cap-and-trade programs designed to control harmful air emissions from large stationary sources. In addition to the IPM model, the contractor shall also use off-line analysis tools developed in the previous contract for these technical analyses to perform this task. The contractor shall analyze the impacts of allocation methods in cap and trade programs under various national emission control scenarios related to regulating multi-pollutant emissions from the electricity power generating sector. In this type of approach, a limited number of emission allowances are made available to the regulated community, which must be surrendered by each source for emissions during the compliance period. By buying or selling allowances, sources can control the degree to which they must control their emissions. A source that finds emission controls to be particularly expensive can buy allowances, in essence, arranging to have another source take over some of its control burden.

The WAM will issue a written request to specify the boundary conditions (i.e. pollutant(s) of interest, the allocated allowances, the current emission control condition, and legally allowed emission quantities or rates) for each of the IPM strategy runs. The contractor shall provide the economic analyses that incorporate the use of the IPM strategy model runs to estimate national, state, and source-specific costs and compliance choices, generation, emissions, and prices that occur from the allocation options specified in the written request. The contractor shall also study up to five alternative modeling methods to ascertain the expected impact of the various allocation methods being modeled. The alternative modeling method will be concentrated in the following two study areas and will be driven by a written request from the WAM:

1. The options of the allocation methods consist of combinations of characteristics relating to the timing of any changes in the allocations, the basis of these changes, and the recipients of the allocations (e.g. "changing the allocation at the beginning of every calendar year and using the average of the past five year's heat input as the basis to calculate the new allocations" vs. "changing the allocation every five years and the units keeping their allocation for that five years.")
2. The Contractor shall project the relative consequences of the options for the electricity market using both basic market analysis and detailed computer simulations (IPM as well as off-line analyses).

For any given combination of pollutants, geographic areas, and cap levels (the "policy case"), the contractor shall complete an analysis for the set of allocation options identified in the WAM's written request. Upon completion of each analysis, the contractor shall deliver a technical support document that describes the policy case being considered; defines a baseline or reference case; introduces the economic analysis; lays out the options that were analyzed; discusses relevant economic issues; examines the effect of allowances on different generation sources; and presents the parsed results of IPM strategy runs to support these findings.

IV. DELIVERABLES

The contractor shall prepare and deliver electronic files in CD ROM format for all of the final versions of the documentation generated under this work assignment to the WAM at the end of the completion of this work assignment.

TASK 1: Work Plan.

TASK 2: Complete IPM model regulatory runs estimating costs, emission reductions, sensitivity of the IPM runs, feasibility of the air emission control technologies, and reliability of the power generations, in roughly 2-6 runs per month based on a schedule (to be identified by the WAM), to support this task. Draft reports (with supporting documentation and results) of each run in electronic file format shall be delivered to the WAM in floppy diskette or CD-ROM format within seven (7) days after receiving the WAM's written request. Electronic versions of these final reports in floppy diskette or CD-ROM format are due to the WAM 14 days after receiving the WAM's comment.

TASK 3: Draft summary for studies in the areas of "financial analyses," "potential impacts upon employment in other economic sectors," "continuing support in the implementation of the National Energy Policy," "the response to Congressional requests," and the "analysis of impacts of carbon regulations" are due three (3) weeks after the WAM issues the written request. The contractor shall expect more than 30% of the studies under the "response to Congressional requests" will be ad-hoc in nature. When the WAM specifies "AD-HOC" in the written request, a draft of these report(s) are due within 3 to 7 working days, which the WAM will specify in the written request. The contractor shall expect 2 revisions of these

draft reports. Modified versions are due one week after the WAM's revision comments. Final versions of these reports are due at the end of this work assignment. Final deliverables shall be submitted to the WAM in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM format.

Draft summaries for impact on EA, SBREFA, and UMRA documents are due 6 weeks after completion of the associated IPM model regulatory runs. Final documents are due 2 weeks after final comments by the WAM. Final documents are due at the end of this work assignment. Final deliverable shall be submitted to the WAM in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM format.

Note: The contractor shall also maintain an in-house IPM model run database as data-depot for CAMD-related IPM runs. These files should be protected inside a contractor password protected ftp facility. The contractor shall initiate and maintain monthly telephone communication with WAM to discuss and resolve operational problems. Depending on the security level, the contractor shall separate CBI documentation from the regular IPM run files when an authorized CAMD/PDB user is able to get access to general IPM run results and when an EPA certified person with CBI clearance is able to get access to CBI files. In addition, when the contractor needs to remove unwanted IPM run files from the database in order to enhance ftp performance, EPA/CAMD related IPM run files may only be removed from the ICF ftp site when the contractor adheres to the following criteria: (1) the contractor informs the WAM of the need and receives permission from the WAM to proceed (2) files are downloaded to 2 DVD or CD sets (one set shall be transferred to the WAM and one set shall be safeguarded by the contractor; (3) the contractor safeguarded set is kept for least three months, allowing the WAM enough time to check the completeness and the integrity of the files (the contractor may then decide to keep the safeguarded set or may destroy them after receiving the written instruction from the WAM) and (4) CBI files are handled under the established CBI documentation transfer mechanism and procedures, and are delivered directly to the appropriate CAMD CBI documentation handler (under the work assignment, Gene-Hua Sun will fulfill this role).

TASK 4: Contractor shall brief the WAM monthly about new development in this upgrading process. An electronic copy of the upgraded model and supporting manual will be due at the end of this work assignment.

TASK 5: When issue papers have been requested, draft issue papers are due 10 days after each of the written requests are issued by the WAM. The contractor shall expect up to four revisions for each of these issue papers. Revisions of the issue papers are due 10 days after receipt of EPA's comment. A final issue paper is due 10 days each after receiving EPA's comments of the draft report. IPM program changes are due within 15 days after receiving the WAM's written request. Diagnostic model runs are due within 7 days after each IPM program changes. Outputs of IPM run results (standardized electronic reports in ".dat," ".rpt," and

“.rpe” files, hard copy of system report, and up to three specific reports [the WAM will specify this in each of the written requests based on EPA’s needs for such IPM runs] developed in IPM version 3.0, 4.0 and/or newer updated work assignment). The contractor shall expect up to 2 sets of these diagnostic model runs for each of the program changes. Summary tables to compare the results for diagnostic model runs and its comparable mirror images (e.g. same boundary condition for base case or policy cases) are due five days after receiving EPA’s comments among the IPM diagnostic run results.

Complete offline analysis and IPM analysis of up to 9 allocations (e.g., 3 allocation approaches per proposed rule) under this work assignment. Approximately 1-3 IPM runs per month may be required based on demand. A draft summary of technical support documents examining allocation options are due 3 weeks after the completion of the associated IPM allocation option runs. The contractor shall expect 2 revision requests from the WAM. The revised white paper is due 1 week after receiving the WAM’s comments. Final documents of all kinds are due 2 weeks after final comments by the WAM. Final documents due to the WAM shall be submitted in electronic form (MS-Word 2003) and transmitted in floppy diskette or CD-ROM. format.

Note: There will be no deliverables under this task item if the WAM does not issue a written request to implement the results from task 2 to IPM version 3.0, 4.0, and/or newer.

Copies:
EPA Work Assignment WAM

1



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-2

☐ Original ☒ Amendment Number: 1

Contract Number
EP-W-08-018

Contract Period
Base Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to approve in full the contractor's work plan and cost estimate dated March 31, 2011. However, the contractor shall not exceed a Cost Ceiling of \$755,000 (approximately 5,382 LOE hours) without written approval of the Contracting Officer.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$0.00

LOE
9000

This Action

\$1,254,123.00

0

Total

\$1,254,123.00

9000

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Cumulative Approved: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Work Assignment Manager Name

GENE-HUA SUN

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-2

☐ Original ☒ Amendment Number: 2

Contract Number
EP-W-08-018

Contract Period
Base Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to raise the cost and level-of-effort interim ceilings. The contractor shall now not exceed a Cost Ceiling of \$1,050,000.00 and an LOE ceiling of 7,514 hours without written approval of the Contracting Officer.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$1,254,123.00

LOE
9000

This Action

\$0.00

0

Total

\$1,254,123.00

9000

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Cumulative Approved: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Work Assignment Manager Name

Branch/Mail Code

GENE-HUA SUN

Phone Number

(Signature)

(Date)

Fax Number

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

(Signature)

(Date)

Fax Number

Other Agency Official Name

Branch/Mail Code 3803R

RACHEL SCHWARTZ

Phone Number 202-564-1053

(Signature)

(Date)

Fax Number

Contracting Official Name

Branch/Mail Code 3803R

RACHEL SCHWARTZ

Phone Number 202-564-1053

(Signature)

(Date)

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number

3-2

☐ Original ☒ Amendment Number: 3

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to raise the Cost/Fee and Level-of-Effort ceilings to the full approved amounts.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12

Cost/Fee

LOE

Previously Approved

\$1,254,123.00

9000

This Action

\$0.00

0

Total

\$1,254,123.00

9000

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Cumulative Approved: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Work Assignment Manager Name

GENE-HUA SUN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contracting Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-2

☐ Original ☒ Amendment Number: 4

Contract Number
EP-W-08-018

Contract Period
Base Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to request a work plan and cost estimate in accordance with the revised Statement of Work.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$1,254,123.00

LOE
9000

This Action

\$0.00

3630

Total

\$1,254,123.00

12,630

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Cumulative Approved: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Work Assignment Manager Name

GENE-HUA SUN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contracting Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

**WORK ASSIGNMENT
STATEMENT OF WORK**

Title: Technical Support for Clean Air Markets Division Regulatory Development Activities

Contractor and Contract #: EP-W-08-018

Work Assignment #: 3-2

Estimated Level of Effort: 12,630

Duration: March 11, 2011 – March 10, 2012

EPA Key Personnel:

Work Assignment Manager (WAM):

Gene-Hua Sun
USEPA/OAR/OAP/CAMD/PDB, 6204J
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Phone: (202)343-9119
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Contracting Specialist:

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Phone: (202) 564-6476
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E-mail: Daniels.Ryan@epa.gov

I. BACKGROUND AND PURPOSE

This is the continuous effort, starting from Work Assignment 0-3, 1-3 and 2-2 of this contract, to acquire the technical support for CAMD/EPA regulatory development activities. Under this work assignment, the contractor shall use the developed "Integrated Planning Model (IPM) Version 4.0, 4.1 and/or newer version to support CAMD regulatory development activities by estimating the operational costs, by estimating emission reductions, and by providing the technical analyses for the economic impacts to the electric power generating sector and users for current regulatory development under the multiple pollutant control strategy. Activities covered in this work assignment include modeling, analyses, and assessment in support of policy development, rulemaking, and impact evaluations related to power generation and other

stationary sources, energy consumption, and the pollutants associated with the power sector and other stationary sources, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM_{2.5}), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO₂) and other greenhouse gases. Activities may be related to the development of the Replacement of Clean Air Interstate Rule (CAIR), and/or the proposal of air toxics standards for coal- and oil- fired electric generating units and finalize the rule under Clean Air Mercury Rule (CAMR), New Source Performance Standards (NSPS), New Source Review (NSR), Maximum Achievable Control Technology (MACT), or other regulatory actions, policy development, or legislative proposals."

Additionally, regulatory support activities also include work related to air quality improvement (NAAQS Review, State Implementation Plans (SIPs), air toxics (MACT reviews), and greenhouse gases (e.g., Federal voluntary programs to lower GHGs and development of cleaner technology, while States begin to address GHGs (e.g. RGGI, California, etc.) and Congress considers legislation (e.g., implementation of mandatory emissions reporting, Senate and House developing comprehensive legislation, etc.)).

In the past, air emissions from the power sector were regulated one pollutant at a time and the regulations were developed under various authorities. Industry has developed and implemented control technologies in incremental steps to mitigate emissions of SO₂, NO_x, particulate matter, and other pollutants, as driven by air pollution policies and regulations. Experience with the interactive effects of previous regulatory approaches, a better understanding of control technology synergies, growing knowledge about the co-benefits of controlling various combinations of pollutants, as well as the growing concern over the continuing environmental impacts of the power generating sector have lead to proposals for integrated approaches to control air emissions from the power generating sector. Most of these integrated approaches include the control of SO₂, NO_x and Hg emissions. Some of the multi-pollutant control technologies have reached a stage of development beyond pilot scale. Included are those technologies that integrate during- and/or post-combustion controls of at least two of the SO₂, NO_x, mercury pollutants, and CO₂ emissions, either in one process or a combination of coordinated and complementary processes. Some of the new coal-fired electricity-generating technologies, which are inherently more efficient than conventional coal-fired power plants, have the potential to generate lower emission of air pollutants and CO₂.

On July 6, 2010, EPA proposed Transport Rule that would significantly reduce emissions that contribute to fine particle and ozone pollution in the eastern United States. Beginning August 2, 2010, EPA held three public hearings on this proposed rule. On September 1, 2010, EPA announced a Notice of Data Availability Supporting Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone. On October 27, 2010, EPA made emissions inventories data supporting the proposed transport rule available for review. On January 7, 2011, EPA issued a NODA for "Federal Implementation Plans to Reduce Interstate Transport of Fine Particulate Matter and Ozone: Request for comment on Alternative Allocations, Calculation of Assurance Provisions Allowance Surrender Requirements, New-Unit Allocations in Indian Country and Allocations by States." EPA intends to finalize this proposed rule as soon as possible to provide certainty for sources and states that emissions reductions will continue and that greater needed reductions will occur in the future. Although this rule gets larger emission reductions accomplished more quickly than CAIR required, additional emissions

reductions will be needed to help states attain current and future air quality standards. EPA has begun the work necessary to apply this proposed template to the 2010 ozone standard. The Agency plans to propose that standard in 2011 and finalize it in 2012.

Under this work assignment, the contractor shall:

- (1) Provide the technical and economic studies under the criteria established by the Work Assignment Contract Officer's Representative (WAM) and CAMD technical staff to support routine EPA rule making processes;
- (2) Evaluate the operational cost and effects among the installed Air Pollutants Control Devices (APCDs), combustor efficiency improvement and its co-benefits on CO₂ reductions, and economic impacts under proposed multi-pollutant reduction rules for fossil fuel fired electric generating units;
- (3) Assess the feasibility and reliability of installing air pollution control technologies for proposed rules in the electric power generating sector under given time frames;
- (4) Assess the uncertainties associated with major parameters used in the IPM model to support CAMD regulatory development activities; and
- (5) Assist the administration in preparing white papers and Microsoft Power Point related slide presentations in answering Congressional and inter-agency demand and public comments related to the products generated from this work assignment.
- (6) New Item: In the remaining three to four months of this work assignment, after approval of the work plan changes under this amendment, the contractor shall assist the WAM in monitoring pipeline charges by preparing and delivering an approximate estimate of the LOE expended during the previous week. The estimate should be a quick, minimum effort assessment reporting the dollars and LOE expended during the previous week. This effort shall not exceed one hour per week.**

II. CONTRACT LEVEL STATEMENT OF WORK REFERENCE

The tasks to be performed under this work assignment are consistent with the areas of analyses authorized in sections A through I of the contract's Statement of Work:

III. STATEMENT OF WORK TASKS

TASK 1: Prepare Work Plan

The Contractor shall prepare a work plan in accordance with the terms of the contract. However, the Government will fund this work assignment in five stages, pending the availability of funds in each stage and the technical support required at that particular time. The contractor may not exceed the interim ceilings without written approval of the Contracting Officer. The initial LOE ceiling for the first stage will be 1,800 hours. Deliverables shall be completed and submitted to EPA/OAR/OAP/CAMD as specified in this work assignment, except to the extent that content or dates are changed through the initiation or full agreement of EPA/OAR/OAP/CAMD. The contractor may use the results obtained from, but not duplicate services provided under Work Assignment Nos. 0-3, 1-3, 2-2 and work assignments from the previous ICF CAMD Mission Support contract.

The contractor shall expect to provide ad-hoc responses for not more than 35% of the LOE involvement. The contractor shall realize that the allocation of effort required under each work area under this work assignment may vary during actual performance. The contractor shall work closely with the WAM through the course of this work assignment to ensure the best of use of LOE under limited funds available. The contractor shall notify the WAM when 90% of the work assignment hours or approved funding level has been accumulated in contractor's accounting system.

TASK 2: Regulation Compliance Costs Analysis to support CAMD/PDB for various Rule Making Processes

The Contractor shall use the Integrated Planning Model (IPM) version 4.0, 4.1 and/or newer version in planning to estimate the national, regional and state compliance costs for the emission reductions established through various multipollutant reduction regulations as specified in the background section. The Agency estimates up to **120 (from 80)** IPM runs will be needed to support one year of the CAMD rule making procedures under this work assignment. The contractor shall expect to parse up to 25 % of these runs (i.e. up to **30 (from 20)** IPM runs) for detailed boiler level information to support EPA's technical studies. The WAM will issue written requests for runs which need to be parsed when specific needs have been identified thru the work assignment order durations. These **120 (from 80)** IPM runs will be used to address the following specific areas:

1. Routine studies: Based on the emission caps established in different regulations and the newly available control cost information acquired during the course of this work assignment, CAMD will need specific IPM runs (e.g. under IPM version 4.0, 4.1 and/or newer version depending on the purpose of the study and the reference base case used for that study) to support CAMD technical studies in order to address issues related to policy development, economic impact assessment, interrogatories from inter- and/or intra-agency effort in rule development, responses to comments from Congressional committees and/or other environmental organizations, and the litigation of the regulations involved with CAMD regulatory development activities, (e.g., CAIR and/or CAMR and its Reconsideration(s)). The Agency also needs to conduct sensitivity, reliability, and feasibility studies for the electric power generating system in installing and/or retrofitting air pollution control devices available in the market for the electric power generating industry to use in compliance with air pollutant reduction regulations. The WAM estimates that **45 (from 30)** IPM runs

under this work assignment will be needed to address these routine studies. For routine analyses, the contractor shall deliver the study results from these IPM runs to the agency three weeks after receiving the written notice from the WAM. The contractor shall expect that 25% of these routine IPM runs will be issued in an ad-hoc manner. Results from ad-hoc runs should be delivered to the WAM within three days after receiving the WAM's written requests. For each IPM run, the WAM will work with CAMD technical staff to determine the input data criteria (i.e., allowable options, limiting parameters, reference base case or policy cases identification, emission caps, and specific constraints) for each IPM model run. These criteria and parameters will be generated based on: (1) The economic analyses needed to examine regulatory options, (2) Comments which the Agency received during the course of this work assignment, or (3) New information received during the CAIR and/or CAMR litigation processes. The contractor shall summarize and present to the WAM the run specification by Excel style spreadsheet before each IPM run. Upon receiving the approval from the WAM, the contractor shall perform these IPM runs. The contractor shall deliver results in the electronic and/or hard copy format according to the deliverable schedules specified in the WAM's written request for the ad-hoc runs. For non-ad-hoc IPM runs, deliverables shall be delivered as specified in the deliverables schedules attached at the end of this Statement of Work.

2. Specific studies to support and/or to revise may include "Financial Analysis," "Potential Impacts Upon Employment in Other Economic Sectors," "Continuing Support in the Implementation of the National Energy Policy," "Support for Response to Congressional Requests," "Analysis of Impacts of Carbon Regulations," and "Costs, Performance, and Availability of Applicable NOx and SO2 Control Measures for Existing and New Cement Kilns in the U.S." Details of these analyses will be discussed in Task 3. The WAM estimates that 25% of the IPM runs effort will be used in this category.
3. Studies to support "Analysis of Allowance Allocation Options". More detail of these runs will be discussed in Task 6. The WAM estimates that 15% of the IPM runs will be used to support this category.
4. Potentially 6-12 studies will be required, in which the contractor shall analyze power generation from renewable and/or nuclear as source and its relationship to the overall electric generation. Analysis may include examining the economics of power generation from renewable or nuclear sources, costs associated with these sources, plus the addition parameter such as the status on nuclear re-licensing and/or life extension, and cost and performance of new nuclear generation.
5. Analyses to provide technical support for complimentary rulemakings for the power sector, including the litigation of the CAIR Reconsideration, any possible mercury legislation (which might be related to CAMR or MACT), Best Available Retrofit Technology (BART), and Maximum Achievable Control Technology (MACT) rule would affect such rule development and/or proposed legislation. The remaining portion of IPM runs will be used to support items 4 and 5 of this task.

For items 2 through 5, the WAM will work with the CAMD technical staff to determine the allowable options and limiting parameters for each of the IPM model analyses. These options and parameters will also be generated based on: (1) The economic analyses needed to examine the regulatory option, (2) The specific studies generated from the Congressional request, or (3) Specific benefit analyses required for RIA. The WAM will issue a written request to the contractor to specify these criteria and deliverable schedule. The contractor shall perform these IPM runs and deliver the results (i.e., electronic and/or hard copy) to the WAM as specified in the written request. Other deliverable items not specified in the WAM's written request shall be delivered as specified in the deliverables schedule attached at the end of this Statement of Work.

TASK 3: Technical Analyses and Documents Preparation for Regulatory Impact Analyses Related Rulemaking Processes

The contractor shall, in order to continue the support of the multi-pollutant reduction rule making efforts under CAIR, CAIR Litigation, any mercury rulemaking activities (that may include revisiting aspects of CAMR), NSR, Section 812 for the Title IV of the CAAA and/or CAIR, NSR settlements, NSPS, the Geological Sequestration Rule, and the GHG Inventory Rulemaking, perform the following technical analyses and documentation preparation as may be required by the rule making processes:

1. Financial Analyses: in this area, when needed, the WAM will issue a written request for the contractor to enhance the financial analyses originally developed by ICF in the previous contract (and subsequent work assignment(s)). The enhancement shall include the findings and specific data obtained in new IPM runs for the case studies specified in Task 2 of this Statement of Work. Topics which need to be updated include power plant economic and viability issues, market efficiency studies, and financial distress analyses. The financial analyses shall include the IPM run results which address the results from assumptions of different emissions control levels, alternative control performance, alternative fuel cost, projection of the types of new power plants on line, and alternative financial assumptions. The relationship developed between these new IPM runs and financial studies shall help the Government to determine the potential impacts on retail electricity prices, coal production, employment, and electricity generation at the State, regional and national levels. The contractor shall also provide the results of these studies to help the Agency to determine the financial impacts of the Best Available Retrofit Technology (BART) and Maximum Achievable Control Technology (MACT) to the rule development activities currently in progress.

2. Regarding the feasibility of installing air pollution control technologies, the contractor shall examine the time needed to install controls and the impact on electric reliability. The contractor shall assist the Agency to identify the control technology installations needed to meet the various emission cap levels for SO₂, NO_x and mercury by the expected time frame. Analysis shall examine the affects on the power utility sector reliability and boiler outage period for the installation of control technologies. Such efforts would assist CAMD in analyzing and assessing NO_x, SO₂, and mercury emission control science/testing and their respective parametric cost and performance. After receiving the WAM's written request, the contractor shall provide the WAM with the essential information to identify the hot spots (e.g. regions in the country which are projected to have higher percentages of control technology installations) and the time frame required for electrical power generation sector to install or retrofit these control technologies.
3. In the support of activities such as the response to Congressional, OMB, inter- or intra-agency requests, and comments received during the public comment periods, the contractor shall provide ad-hoc technical analyses to support the EPA in preparation documentation to respond to Congressional, OMB, and inter- or intra-agency requests for technical evaluation of information. In addition to using the IPM model (e.g. both version 4.0, 4.1 and/or newer version depending to the type of analyses), the contractor shall also first upgrade and use the off-line analysis tools, such as TRUM model which needs to be upgraded under this work assignment to match the IPM version 4.0 assumptions, to perform this sub-task. The contractor shall expect no more than ten (10) studies in this sub-task. When all of them need to be done by TRUM, the contractor shall expect no more than 30% of these TRUM model run results will be requested by the WAM's TD to be verified by full scale of the IPM model run. Draft reports resulting from these quick turn-around operations are due five (5) working days after receiving the WAM's written request. Implementation of a new modeling platform to demonstrate potential air quality benefits available through energy efficiency measures on HEDDs will require 1) enabling IPM to output results at an hourly level, and 2) synchronizing IPM and the air quality modeling platform (CMAQ) in their use of meteorological data and energy demand data, 3) conducting two runs with and without energy efficient measures to analyze reduction in emission levels on HEDD days, and 4) preparing air quality modeling ready files.
4. EPA may chose to undertake analysis related to the costs, performance, and availability of applicable NO_x and SO₂ control measures for existing and new cement kilns in the U.S. Such analysis will be issued to the contractor as a technical direction. Current LOE for this analysis should not exceed 100 hours.

In addition, when performing the analyses specified in items 1, 2, and 3 of this task, the contractor shall identify the impact of these changes to the existing regulatory support documents, including the documentation for the economic analyses (EA), the Small Business Regulatory Enforcement Fairness Act (SBREFA), and the Unfunded Mandates Reform Act (UMRA). The contractor shall summarize and present the differences between the results from these new studies and from the existing regulatory support documents to the WAM. When the differences are significant, the WAM will issue a written request to the contractor clarifying the

sections and the contents in these documents which need to be updated to reflect the new study results.

Depending on the significance of new information, the WAM will issue a written request for the documentation specified as above. Upon receiving a written request, the contractor shall prepare the draft update documentation and deliver it to the WAM for review. The contractor shall expect up to two (2) revisions prior to finalization of these documents.

TASK 4: Upgrade the TRUM software and Analysis of Sensitivity of Control Costs for NO_x, SO₂ and Mercury (Hg) Generated Among the Proposed Rules Developed under Multi-pollutant Reduction Technologies

As part of the efforts in collecting control technology information to support the future NEEDS database, the contractor shall work with the WAM through technical direction to provide technical support for collecting and developing algorithms for capital, fixed O&M, and variable O&M costs for existing IGCC facilities and pollution control technologies (e.g., such as wet ESP, solvent injection, SO₂ control and similar technologies) installed in existing fossil-fueled power generating units. Because of the slow responses from the industry, the WAM recognizes these continuous efforts shall be handled through the full contract period. For the budget purpose, upgraded NEEDS database is only listed as a potential working area. The contractor shall be ready to work on this area when receiving the written notice from WAM when new data becomes available.

The NEEDS database and IPM model version 4.0 and/or newer will reflect the updates from previous IPM and NEEDS versions regarding the model plants (e.g., basic units used in IPM models to group similar characteristics boilers in the sense of the boiler types, fuel uses, allowable emission control device selection, etc.). The TRUM model, a simplified IPM full version, uses a reduced model plants package with limited user choice variables but is capable of representing the full version IPM run with some deviation. This capability can save the Government a lot of computer time and facility requirements (e.g., CPU speed, installed memory size, and hard-disk space). Since the TRUM model is not as powerful as the full version of the IPM, it allows CAMD to do in-house quick and rough evaluations of sensitive issues in the rulemaking process without requiring time consuming full IPM version model runs. An older version of the TRUM model is based on an earlier version of the NEEDS. In order to provide the Government the same level of support, under this work assignment, the contractor shall update the TRUM model based on NEEDS database which support IPM model 4.0 or newer. This updated model should be developed in a stand-alone software manner so it can either be installed and used by CAMD staff when installed in EPA owned equipment, or be installed in a contractor designated and security-cleared machine in the contractor's office with the criteria (such as boundary condition, run years) set by CAMD experts. This option will provide the Government a choice to run this model in the most cost effective way if the Government experiences a manpower shortage during the major data crunch period.

TASK 5: Update IPM Parameters and Capabilities in Support of Sensitivity Study as Specified in Task 2

When needed, the WAM will issue a written request to the contractor to use the results from task 4 to update the IPM parameters and capabilities used in the IPM version 4.0 or newer model. Upon receiving this request, the contractor shall update requested parameters and capabilities of the Integrated Planning Model to ensure that results obtained under Task 2 are technically defensible. The WAM will also specify in the written request the specific functional areas (e.g., installation cost, O&M cost, efficiency, applicability, and reliability) to be updated. For each functional area, the contractor shall prepare a typed issue paper of 15 pages or less which shall include the following information:

- Description of the parameters and capabilities to be updated,
- Identification of policy and technical issues to be resolved,
- Sources of data for the update.

In addition, for each issue paper, the contractor shall include not more than five extra discussion topics which will be clarified by the WAM in the written request for these issue papers.

The WAM and CAMD technical staff will review the issue paper, provide feedback to resolve technical and policy issues, and issue written requests authorizing programming to implement the update. The contractor shall make the programming changes and perform two sets of diagnostic model runs to test the programming changes. The contractor shall provide the WAM with outputs from the diagnostic runs for review and comment.

For budgeting purposes, the contractor shall assume that the WAM will request updates of seven (7) functional areas in preparation for an issue paper in each of the areas, presentation of initial and final run outputs demonstrating achievement of the updated capabilities, and documentation of the updated parameters and capabilities. The delivery schedule for the issue papers, initial and final run outputs, and documentation will be specified by the WAM in the written request.

TASK 6: Allocation Analysis for Multi-pollutants under Cap and Trade Program

Like most of the existing air pollutant emission reduction rules (e.g., Title IV, SIP Call and S-126), CAIR and CAMR rules (both final rule and rule reconsideration) also include the Cap and Trade Program elements. These rules allow States to use the federal operated Cap and Trade Program to support States in compliance with these rules. When implemented, the Federal Government will calculate and allocate the pollutants allowances for each of the existing power generating units based on the heat input data. The Agency will likely need analyses of allocations methods that may include NO_x, SO₂, Hg, or CO₂.

In the rule making and litigation processes, the contractor shall provide analytical support for the evaluation of emission allowance allocation options within cap-and-trade programs designed to control harmful air emissions from large stationary sources. In addition to the IPM model, the contractor shall also use off-line analysis tools developed in the previous contract for these technical analyses to perform this task. The contractor shall analyze the impacts of allocation methods in cap and trade programs under various national emission control scenarios related to regulating multi-pollutant emissions from the electricity power generating sector. In this type of

approach, a limited number of emission allowances are made available to the regulated community, which must be surrendered by each source for emissions during the compliance period. By buying or selling allowances, sources can control the degree to which they must control their emissions. A source that finds emission controls to be particularly expensive can buy allowances, in essence, arranging to have another source take over some of its control burden.

The WAM will issue a written request to specify the boundary conditions (i.e. pollutant(s) of interest, the allocated allowances, the current emission control condition, and legally allowed emission quantities or rates) for each of the IPM strategy runs. The contractor shall provide the economic analyses that incorporate the use of the IPM strategy model runs to estimate national, state, and source-specific costs and compliance choices, generation, emissions, and prices that occur from the allocation options specified in the written request. The contractor shall also study up to five alternative modeling methods to ascertain the expected impact of the various allocation methods being modeled. The alternative modeling method will be concentrated in the following two study areas and will be driven by a written request from the WAM:

1. The options of the allocation methods consist of combinations of characteristics relating to the timing of any changes in the allocations, the basis of these changes, and the recipients of the allocations (e.g. "changing the allocation at the beginning of every calendar year and using the average of the past five year's heat input as the basis to calculate the new allocations" vs. "changing the allocation every five years and the units keeping their allocation for that five years.")
2. The Contractor shall project the relative consequences of the options for the electricity market using both basic market analysis and detailed computer simulations (IPM as well as off-line analyses).

For any given combination of pollutants, geographic areas, and cap levels (the "policy case"), the contractor shall complete an analysis for the set of allocation options identified in the WAM's written request. Upon completion of each analysis, the contractor shall deliver a technical support document that describes the policy case being considered; defines a baseline or reference case; introduces the economic analysis; lays out the options that were analyzed; discusses relevant economic issues; examines the effect of allowances on different generation sources; and presents the parsed results of IPM strategy runs to support these findings.

IV. DELIVERABLES

The contractor shall prepare and deliver electronic files in CD ROM format for all of the final versions of the documentation generated under this work assignment to the WAM at the end of the completion of this work assignment.

TASK 1: Work Plan.

TASK 2: Complete IPM model regulatory runs estimating costs, emission reductions, sensitivity of the IPM runs, feasibility of the air emission control technologies,

and reliability of the power generations, in roughly **4-9 (from 2-6)** runs per month based on a schedule (to be identified by the WAM), to support this task. Draft reports (with supporting documentation and results) of each run in electronic file format shall be delivered to the WAM in floppy diskette or CD-ROM format within seven (7) days after receiving the WAM's written request. Electronic versions of these final reports in floppy diskette or CD-ROM format are due to the WAM 14 days after receiving the WAM's comment.

TASK 3: Draft summary for studies in the areas of "financial analyses," "potential impacts upon employment in other economic sectors," "continuing support in the implementation of the National Energy Policy," "the response to Congressional requests," and the "analysis of impacts of carbon regulations" are due three (3) weeks after the WAM issues the written request. The contractor shall expect more than 30% of the studies under the "response to Congressional requests" will be ad-hoc in nature. When the WAM specifies "AD-HOC" in the written request, a draft of these report(s) are due within 3 to 7 working days, which the WAM will specify in the written request. The contractor shall expect 2 revisions of these draft reports. Modified versions are due one week after the WAM's revision comments. Final versions of these reports are due at the end of this work assignment. Final deliverables shall be submitted to the WAM in electronic form (MS-Word **2007 or 2003 (from 2003)**) and transmitted in floppy diskette or CD-ROM format.

Draft summaries for impact on EA, SBREFA, and UMRA documents are due 6 weeks after completion of the associated IPM model regulatory runs. Final documents are due 2 weeks after final comments by the WAM. Final documents are due at the end of this work assignment. Final deliverable shall be submitted to the WAM in electronic form (MS-Word **2007 or 2003 (from 2003)**) and transmitted in floppy diskette or CD-ROM format.

Note: The contractor shall also maintain an in-house IPM model run database as data-depot for CAMD-related IPM runs. These files should be protected inside a contractor password protected ftp facility. The contractor shall initiate and maintain monthly telephone communication with WAM to discuss and resolve operational problems. Depending on the security level, the contractor shall separate CBI documentation from the regular IPM run files when an authorized CAMD/PDB user is able to get access to general IPM run results and when an EPA certified person with CBI clearance is able to get access to CBI files. In addition, when the contractor needs to remove unwanted IPM run files from the database in order to enhance ftp performance, EPA/CAMD related IPM run files may only be removed from the ICF ftp site when the contractor adheres to the following criteria: (1) the contractor informs the WAM of the need and receives permission from the WAM to proceed (2) files are downloaded to 2 DVD or CD sets (one set shall be transferred to the WAM and one set shall be safeguarded by the contractor; (3) the contractor safeguarded set is kept for least three months, allowing the WAM enough time to check the completeness and the integrity of the files (the contractor may then decide to keep the safeguarded set or may

destroy them after receiving the written instruction from the WAM) and (4) CBI files are handled under the established CBI documentation transfer mechanism and procedures, and are delivered directly to the appropriate CAMD CBI documentation handler (under the work assignment, Gene-Hua Sun will fulfill this role).

TASK 4: Contractor shall brief the WAM monthly about new development in this upgrading process. An electronic copy of the upgraded model and supporting manual will be due at the end of this work assignment.

TASK 5: When issue papers have been requested, draft issue papers are due 10 days after each of the written requests are issued by the WAM. The contractor shall expect up to four revisions for each of these issue papers. Revisions of the issue papers are due 10 days after receipt of EPA's comment. A final issue paper is due 10 days each after receiving EPA's comments of the draft report. IPM program changes are due within 15 days after receiving the WAM's written request. Diagnostic model runs are due within 7 days after each IPM program changes. Outputs of IPM run results (standardized electronic reports in ".dat," ".rpt," and ".rpe" files, hard copy of system report, and up to three specific reports [the WAM will specify this in each of the written requests based on EPA's needs for such IPM runs] developed in IPM version 3.0, 4.0 and/or newer updated work assignment). The contractor shall expect up to 2 sets of these diagnostic model runs for each of the program changes. Summary tables to compare the results for diagnostic model runs and its comparable mirror images (e.g. same boundary condition for base case or policy cases) are due five days after receiving EPA's comments among the IPM diagnostic run results.

Complete offline analysis and IPM analysis of up to 9 allocations (e.g., 3 allocation approaches per proposed rule) under this work assignment. Approximately 1-3 IPM runs per month may be required based on demand. A draft summary of technical support documents examining allocation options are due 3 weeks after the completion of the associated IPM allocation option runs. The contractor shall expect 2 revision requests from the WAM. The revised white paper is due 1 week after receiving the WAM's comments. Final documents of all kinds are due 2 weeks after final comments by the WAM. Final documents due to the WAM shall be submitted in electronic form (MS-Word 2007 or 2003 (from 2003)) and transmitted in floppy diskette or CD-ROM. format.

Note: There will be no deliverables under this task item if the WAM does not issue a written request to implement the results from task 2 to IPM version 3.0, 4.0, and/or newer.

Copies:

EPA Work Assignment WAM

1



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-2

☐ Original ☒ Amendment Number: 5

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to raise the interim approved LOE ceiling to 10,000 LOE hours and the interim Cost/Fee Ceiling to \$1,379,123.00. The Cost/Fee interim approved ceiling increase of \$125,000.00 is to enable the contractor to continue work until approval of a new "Authorized Work Assignment Ceiling" Cost/Fee amount.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 5)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$1,254,123.00

LOE
12,360

This Action

\$0.00

0

Total

\$1,254,123.00

12,630

Work Plan / Cost Estimate Approvals

Contractor WP Dated: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Cumulative Approved: 3/31/11

Cost/Fee: \$1,254,123.00

LOE: 9000

Work Assignment Manager Name

Branch/Mail Code

GENE-HUA SUN

Phone Number

(Signature)

(Date)

Fax Number

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

(Signature)

(Date)

Fax Number

Other Agency Official Name

Branch/Mail Code 3803R

RACHEL SCHWARTZ

Phone Number 202-564-1053

(Signature)

(Date)

Fax Number

Contracting Official Name

Branch/Mail Code 3803R

RACHEL SCHWARTZ

Phone Number 202-564-1053

(Signature)

(Date)

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number

3-2

☐ Original ☒ Amendment Number: 6

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
Technical Support for Clean Air Markets Division
Regulatory Development Activities

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated November 30, 2011.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 8)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 5)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$1,254,123.00

LOE
12,630

This Action

\$ 516,669.00

0

Total

\$1,770,792.00

12,630

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 11/30/11

Cost/Fee: \$1,770,792.00

LOE: 12,360

Cumulative Approved: 11/30/11

Cost/Fee: \$1,770,792.00

LOE: 12,360

Work Assignment Manager Name

GENE-HUA SUN

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contracting Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1053

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

12/13/11

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment Number

3-3

Work Assignment☒ Original ☐ Amendment Number:Contract Number
EP-W-08-018Contract Period
Base

Option Period Number III

Title of Work Assignment
Atmospheric Deposition Modeling Support for
TMDLs and Watershed AnalysesContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out
☐ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12

Cost/Fee

LOE

Previously Approved

This Action

\$0.00

145

Total

\$0.00

145

Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

RUTH A. CHEMERYS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

STATEMENT OF WORK

Title: Atmospheric Deposition Modeling Support for TMDLs and Watershed Analyses

Contractor and Contract #: ICF EP-W-08-018

Work Assignment#: 3-3

Work Assignment Manager (WAM):

Ruth Chemerys
EPA Office of Water
Assessment and Watershed Protection Division
1200 Pennsylvania Ave., NW
Mailcode 4503-T
Washington, DC 20460
Email: chemerys.ruth@epa.gov

Contracts Specialist:

Ryan Daniels
Office of Administration and Resource Management
1200 Pennsylvania Ave., NW
Mailcode 3803R
Washington, DC 20460
Email: daniels.ryan@epa.gov

Background and Purpose

Under previous work assignments (Contract No. 68-W-03-028 Work Assignment No. 4-30, and Contract No. EP-W-08-018 Work Assignment No. 1-6 and Work Assignment No. 2-6), the EPA Office of Water conducted atmospheric deposition modeling for the pollutant mercury. The modeling was conducted for EPA by ICF with the purpose of providing States and EPA Regions with data needed to support Total Maximum Daily Load (TMDL) and related watershed analyses.

Over 8,800 water-bodies are listed by states as impaired by mercury and states must develop TMDLs for impaired waters. TMDLs identify the pollutant loadings to a water-body and determine the pollutant loads reductions needed to meet water quality standards. TMDLs account for pollutants loadings from both water point sources and non-point sources, including pollutants from atmospheric sources. In many water-bodies, atmospheric deposition is the predominant source of mercury.

The mercury deposition modeling conducted under the previous Work Assignment No. 4-30 used the Regional Modeling System for Aerosols and Deposition (REMSAD) and the Community Multi-scale Air Quality (CMAQ) model. A report summarizing the model results was prepared under these work

assignments, including tables and graphics summarizing model results for each state. Additional model runs were also conducted under EP-W-08-018 Work Assignment No. 1-6 using selected updated source and emissions information provided by selected states. EPA has distributed the model results and report to the States and Regions. Under Work Assignment No. 2-6, the CMAQ model was further investigated and found to over-predict mercury deposition in parts of the US.

The purpose of this work assignment is to: 1) conduct additional modeling and sensitivity analyses regarding CMAQ model results in order to evaluate changes to the model code made since the last work assignment; and 2) continue with assistance to EPA in answering technical questions from states and other stakeholders about the modeling and report, and conducting limited analyses to assist in explaining the model results.

Task Descriptions

The contractor shall conduct the following tasks:

Task 1: Prepare Work Plan

The Contractor shall prepare a Work Plan in accordance with the terms and conditions of the contract.

Task 2: CMAQ Sensitivity Analyses & Presentation of Findings

Subtask 2A - Sensitivity Analyses:

Investigations and sensitivity analyses of the CMAQ model conducted under a prior Work Assignment No. 2-6 identified excessively high dry deposition of mercury in parts of the US in the model outputs. The EPA Office Research and Development has developed a beta version of their next release of the CMAQ model with changes to the CMAQ code which are intended in part to remedy the excessively high deposition predicted in the earlier CMAQ release. Under this subtask, the contractor shall conduct sensitivity analyses of the latest CMAQ version in order to evaluate its performance. Specific sensitivity analyses to be conducted include but are not limited to examining:

- 1) The effect of competing schemes for addressing boundary conditions, e.g. GEOS-Chem vs. hemispheric CMAQ runs;
- 2) Relative model performance using alternative meteorological databases such as WRF and MM5; and
- 3) Key changes to the treatment of mercury chemistry, including the effect of the nitrate oxidation reaction.

Subtask 2B – Presentation of Findings:

The contractor shall document the procedures followed and results of sensitivity analyses conducted under subtask 2A above in the form of a poster to be delivered at the 10th International Conference on Mercury as a Global Pollutant, in Halifax, Nova Scotia in August 2011.

Deliverables and schedule:

The contractor shall provide a memo to the WAM summarizing the results of Subtask 2A within 2 months of the start of the work assignment. A draft of the poster to be compiled under Subtask 2B shall be provided to the WAM within 3 months of the start of the work assignment.

Task 3: Assist in Responding to Questions from EPA Regions and States

The contractor shall participate with the WAM and other EPA technical staff on conference calls with regions, states and other stakeholders to answer questions about modeling results. The contractor shall conduct a limited number of follow-up analyses regarding model results based on questions from regions, states and stakeholders. For example, stakeholders in a state have questioned whether the REMSAD results for that state may be too high. The contractor may then assist in compiling source and emissions data used in the modeling for a particular state or region. The contractor may also aggregate or breakdown the model results for a particular state by different source categories and/or geographic areas, or provide alternative graphic displays of model results for a particular state or geographic area.

Deliverables and schedule:

Up to 5 conference calls as scheduled by the WAM, and up to 5 analyses and/or displays of model results for selected states or geographic areas (the WAM may schedule additional calls and analyses depending on resources). Dates for the calls and analyses will be determined by the WAM based on each Regions and/or States' availability and needs.



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number

3-3

☐ Original ☒ Amendment Number: 1

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
Atmospheric Deposition Modeling Support for
TMDLs and Watershed Analyses

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated March 31, 2011.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 8)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$0.00

LOE
145

This Action

\$21,319.00

(23)

Total

\$21,319.00

122

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 03/31/11

Cost/Fee: \$21,319.00

LOE: 122

Cumulative Approved: 03/31/11

Cost/Fee: \$21,319.00

LOE: 122

Work Assignment Manager Name

Branch/Mail Code

RUTH A. CHEMERYS

Phone Number

(Signature)

(Date)

Fax Number

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

(Signature)

(Date)

Fax Number

Other Agency Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contracting Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-3

☐ Original ☒ Amendment Number: 2

Contract Number
EP-W-08-018

Contract Period
Base

Option Period Number III

Title of Work Assignment
Atmospheric Deposition Modeling Support for
TMDLs and Watershed Analyses

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to add Douglas Norton as the Alternate Work Assignment Manager.

Douglas Norton
1200 Pennsylvania Avenue, N. W.
Mail Code: 4503T
Washington, DC 20460
Phone: 202-566-1221
Email: norton.douglas@epa.gov

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$21,319.00

LOE
122

This Action

\$0.00

0

Total

\$21,319.00

122

Work Plan / Cost Estimate Approvals

Contractor WP Dated: 03/31/11

Cost/Fee: \$21,319.00

LOE: 122

Cumulative Approved: 03/31/11

Cost/Fee: \$21,319.00

LOE: 122

Work Assignment Manager Name

RUTH A. CHEMERYS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

RACHEL SCHWARTZ

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

7/12/11

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-4☒ Original ☐ Amendment Number:Contract Number
EP-W-08-018Contract Period
Base

Option Period Number III

Title of Work Assignment

Support for the Clean Air Act Advisory Committee
and the Clean Air Excellence Awards ProgramContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out
☐ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 8)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee

LOE

This Action

\$0.00

2515

Total

\$0.00

2515

Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

JAMES CHILDERS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

STATEMENT OF WORK

TITLE: Support for the Clean Air Act Advisory Committee (CAAAC) and Subcommittees and 2011 Clean Air Excellence Awards program

CONTRACT NO.: EP-W-08-018

WORK ASSIGNMENT NO.: 3-4

PERIOD OF PERFORMANCE: March 11, 2011 - March 10, 2012

ESTIMATE LEVEL OF EFFORT: 2515

EPA KEY PERSONNEL: Pat Childers, Designated Federal Official (DFO) for the CAAAC and Program Manager for the Clean Air Excellence Awards program

WORK ASSIGNMENT MANAGER (WAM):

Pat Childers
1200 Pennsylvania Avenue, NW
Washington, DC 20004
Mail Code 6102A
Phone: (202) 564 -1082
E-mail: childers.pat@epa.gov

BACKGROUND

EPA originally established the Clean Air Act Advisory Committee (CAAAC) in November 1990, and renewed the charter of the CAAAC seven times to maintain its function until November 15, 2006. The committee is authorized under the Federal Advisory Committee Act, 5 U.S.C., App. Section 9(c). The purpose of the Committee is to provide independent advice and counsel to the Agency on policy and technical issues associated with the implementation of the Clean Air Act Amendments of 1990 (CAA). The Advisory Committee consists of some 40 members from the regulated and private industry, the academic community, state and local government and environmental organizations. The Committee is normally consulted three times a year on economic, environmental, technical, scientific and enforcement issues. The results of these meetings will be a written report providing advice to U.S. EPA on implementing the CAA.

Much of the work of the CAAAC is accomplished through its subcommittees. Currently there are three (4) subcommittees: 1) Permits/NSR/Toxics; 2) Economic Incentives and Regulatory Innovation; 3) Mobile Sources Technical Review Subcommittee. This statement of work will provide contractor meeting support for the full committee and its subcommittees.

PURPOSE AND SCOPE OF WORK

This statement of work under this contract will provide for general conference support and other duties related to supporting the CAAAC and its three subcommittee's activities for a twelve (12) month period from March 11, 2011 to March 10, 2012. The contractor shall prepare documents for U.S. EPA's use that present the advice and specific recommendations of the CAAAC and its appropriate subcommittees on issues related to implementing the CAA. In order to prepare these documents, the contractor shall convene up to (4) one - three day meetings of the CAAAC and its subcommittees and undertake other appropriate advisory committee support activities as described in the following tasks. The meetings will be held approximately four months apart with the exact dates and location to be determined by the WAM. The contractor shall provide support for this meeting as described in the tasks below.

Specific tasks to be accomplished under the proposed contract include:

TASKS

Task 1: Prepare Work Plan: The Contractor shall prepare a work plan in accordance with the terms and conditions of the contract clause B.2 "Work Assignments" and Attachment 2 "Reports of Work" section entitled: "Preparation and Submission of Work Plans."

Task 2: Monthly Progress Reports. The contractor shall prepare monthly progress reports in accordance with the terms and conditions of the contract.

Task 3: Meeting planning and logistical support. The contractor shall provide planning and logistical support for the CAAAC and its subcommittees meetings. Meeting planning shall include hotel site investigation and selection, solicitation of competitive hotel bids, as necessary, arrangement of meeting space and provision of all equipment and meeting supplies.

Logistical support shall be provided in advance of the meetings as well as during the meetings. The contractor shall be responsible for coordinating all on-site logistical support during these committee and subcommittee meetings. Such support shall include determining the most advantageous meeting room configuration, staffing registration desks, coordinating the transcription of proceedings, document distribution, coordinating audio-visual aids, and providing other support activities at the meetings as required.

Task 4: Administrative Support. The contractor shall provide administrative support as necessary to facilitate or expedite preparation for, and the conduct of, the meetings. Activities conducted under this task shall include, but are not limited to, the following:

- Preparing registration list;
- Preparing name badges and table cards;
- Handling communications with attendees in advance of meetings;
- Assembling and reproducing background or supplemental materials;
- Preparing and distributing meeting agendas;

- Developing and maintaining mailing lists;
- Documenting proceedings and preparing minutes in accordance with the Federal Advisory Committee Act requirements for full committee meeting only;
- Utilizing commercial message service for the purpose of receiving and disseminating information. It is estimated that commercial message services will be required no more than five (5) times per meeting;
- Performing any administrative support activities such as, the reproduction and distribution of information and analyses prepared at the Committee and meetings, assisting CAAAC members in obtaining information and materials relevant to CAAAC discussions.

Task 5: Technical and Analytical Support for Presentation. The contractor shall provide technical support to the Committee meetings by conducting analyses and providing other technical support for the preparation of presentation, briefings, issues papers, and background and/or supplemental materials associated with the meetings and the topics addressed at the meetings. Graphics support, if needed, shall be included. There will be no more than three (3) topics for this meeting that would require contractor support. WAM technical direction is required for analytical and/or technical support.

Task 6: Prepare draft and final documents summarizing CAAAC recommendations, and technical recommendations to the EPA. Draft documents, including comprehensive minutes of all full committee meetings, shall be prepared and submitted to the WAM for review within three (3) weeks following the meetings. Draft documents shall be reviewed and approved by the WAM prior to return to contractor. WAM review comments will be provided two (2) weeks following receipt of draft documents. Final documents shall be submitted one (1) week following receipt of agency comments.

Task 7: Support to the Clean Air Excellence Awards Program. The contractor shall provide technical, analytical and logistical support to the WAM in the management of the Clean Air Excellence Awards Program, an annual OAR awards program originally recommended to EPA-OAR by the Advisory Committee. Draft and final materials, including but not limited to the following: outreach information announcing the year 2011 program, award proposal packets, scoring sheets for judging proposals, summary listing of proposals and their scoring by OAR and CAAAC reviewers, award ceremony program, summary of winners' projects, award certificates, and other appropriate documents shall be prepared in support of both the 2010 and 2011 annual awards program. The contractor will work in close coordination with the WAM to provide support to CAAAC members, OAR staff and senior OAR management in the successful implementation of this task item.

DELIVERABLES

1. Work Plan
2. Monthly Progress Reports

3. Planning and logistical support under Task 2 will be provided to the agency in advance of the CAAAC and subcommittee(s) meetings. The WAM will notify the contractor of meeting date requirements in order that advance logistical support can be provided under the terms of the Statement of Work.
4. Administrative support under Task 3 will be provided to the agency (CAAAC and its subcommittees) approximately 2 to 3 days prior to each meeting under the direction of the WAM. Support during the meetings will be provided in a manner that best facilitates the effective conduct of the meetings.
5. Technical and analytical support (CAAAC and its subcommittees) for use at its meetings under the direction of the WAM and in consultation with appropriate senior EPA managers.
6. Summary Documents - As described in Task 5, the contractor shall submit a draft summary document, including comprehensive minutes of all full committee meetings, and final summary document following each full committee meeting of the CAAAC. Draft documents are due within three weeks following the conclusion of each meeting unless otherwise notified by the WAM. Final documents are due within two weeks following the receipt of EPA review comments. EPA comments will be provided no later than two weeks from receipt of the draft documents.
7. Documents and other information described in Task 7 shall be prepared at the direction of the WAM for his review and approval. Due dates will be determined by the WAM, based upon an approved schedule for the implementation of the year 2010 awards program.



United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-4

☐ Original ☒ Amendment Number: 1

Contract Number
EP-W-08-018

Contract Period
Base Option Period Number III

Title of Work Assignment
Support for the Clean Air Act Advisory Committee
and the Clean Air Excellence Awards Program

Contractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 03/10/12

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated March 31, 2011.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee
\$0.00

LOE
2515

This Action

\$474,250.00

0

Total

\$474,250.00

2515

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 03/31/11

Cost/Fee: \$474,250.00

LOE: 2515

Cumulative Approved: 03/31/11

Cost/Fee: \$474,250.00

LOE: 2515

Work Assignment Manager Name

Branch/Mail Code

JAMES P. CHILDERS

Phone Number

(Signature)

(Date)

Fax Number

Project Officer Name

Branch/Mail Code

RYAN T. DANIELS

Phone Number

(Signature)

(Date)

Fax Number

Other Agency Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contracting Official Name

Branch/Mail Code 3803R

DEBRA A. MILLER

Phone Number 202-564-1041

(Signature)

(Date)

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

United States Environmental Protection Agency
Washington, DC 20460**Work Assignment**Work Assignment Number
3-5☒ Original ☐ Amendment Number:Contract Number
EP-W-08-018Contract Period
Base

Option Period Number III

Title of Work Assignment

Summary Report of Workshop on Improving
Assessment and Valuation of Climate Change
Impacts for Policy and Regulatory AnalysisContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☒ Work Assignment Initiation ☐ Work Assignment Close-Out
☐ Work Assignment Amendment ☐ Incremental Funding
☐ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 06/30/11

Comments:

The contractor shall prepare a work plan and cost estimate in accordance with the attached Statement of Work.

☐ Superfund**Accounting and Appropriations Data**☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment CeilingContract Period: 3/11/08 to 3/10/12
Previously Approved

Cost/Fee

LOE

This Action

\$0.00

220

Total

\$0.00

220

Work Plan / Cost Estimate Approvals

Contractor WP Dated :

Cost/Fee:

LOE:

Cumulative Approved:

Cost/Fee:

LOE:

Work Assignment Manager Name

ANDREW P. MANALE

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Project Officer Name

RYAN T. DANIELS

(Signature)

(Date)

Branch/Mail Code

Phone Number

Fax Number

Other Agency Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contracting Official Name

DEBRA A. MILLER

(Signature)

(Date)

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date

STATEMENT OF WORK

Title: Summary Report of Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis

Contract No.: EP-W-08-018

Work Assignment No.: 3-5

Work Assignment Manager (WAM):

Andrew Manale
1200 Pennsylvania Avenue, N. W.
Mail Code: 1809T
Washington, DC 20460
(202) 566-2309
manale.andrew@epa.gov

Alternate Work Assignment Manager (WAM):

Chris Dockins
1200 Pennsylvania Avenue, N. W.
Mail Code: 1809T
Washington, DC 20460
(202) 566-2286
Dockins.chris@epa.gov

Period of Performance: March 11, 2011 thru June 30, 2011

I. BACKGROUND:

The Clean Air Markets Division (CAMD) in the Office of Atmospheric Programs (OAP) within EPA's Office of Air and Radiation (OAR) requires state-of-the-art modeling and economic analysis capabilities to carry out its mission. CAMD's mission includes operating and assessing regulatory programs like the Acid Rain Program, the Clean Air Interstate Rule (CAIR), and the Clean Air Mercury Rule (CAMR) and developing new programs for controlling emissions from large stationary sources. Modeling, analyses, and assessment will be needed for policy development, rulemaking, and impact evaluations related to power generation, energy consumption, and the pollutants associated with the power sector, including sulfur dioxide (SO₂), nitrogen oxides (NO_x), particulate matter (PM_{2.5}), mercury (Hg), and other toxic air pollutants as well as emissions of carbon dioxide (CO₂) and other greenhouse gases.

In support of assessment for policy development, the Administration has over the past year sought to develop a transparent and defensible range of values to use in regulatory analysis for quantifying the social costs of adding (or social benefits of removing) one ton

of carbon dioxide from the atmosphere. This value is referred to as the “social cost of carbon” (SCC). As a monetary measure of the incremental damage resulting from carbon emissions, the SCC is intended to include the global economic impacts of climate change, including but not limited to effects on agricultural productivity, human health, coastal property, and ecosystem services.

Most SCC estimates have been derived from one of three simulation or dynamic optimization models commonly referred to as integrated assessment models (IAMs): DICE (by William Nordhaus at Yale University), FUND (by Richard Tol at the Economic Social Research Institute in Dublin, Ireland), and PAGE (by Chris Hope at the University of Cambridge). These IAMs combine reduced-form representations of climate processes, economic growth, and feedbacks between the two in a single modeling framework. Ongoing work seeks to update these models by incorporating more of these complex interactions and improving the representation of physical and economic processes. Uncertainty in the magnitude of the physical impacts from climate change and a lack of economic damage estimates for some impacts make this overall exercise difficult.

In the summer of 2009, an interagency group developed a set of interim SCC values based on existing estimates in the literature for use in Federal regulatory analysis until a more comprehensive analysis could be conducted. Subsequently, an interagency group convened to discuss key inputs and assumptions that were then used to generate SCC estimates based on DICE, PAGE, and FUND. An extensive review of the literature was conducted to select three sets of input parameters for these models: climate sensitivity, socio-economic parameters, and the discount rate. Since each IAM takes a different approach to modeling damages, all other model features were left unchanged, relying on the model developers’ best estimates.

In our effort to estimate SCC using these three IAMs we found that some components of these models could be improved by additional modeling refinements and empirical research. Chief among these are the damage functions, which do not include some potentially important impact categories. For example, ocean acidification from CO₂ emissions is a source of potentially large damages that is not quantified explicitly in any of the three models. Tol (2009) has highlighted others: “...the big unknowns include: extreme climate scenarios, the very long term, biodiversity loss, the possible effects of climate change on economic development and even political violence.” The interagency group adjourned noting a need to thoroughly review the damage functions—in particular, how they incorporate adaptation, technological change, and catastrophic damages—and to document more thoroughly omitted impacts. Often, gaps in the economic and integrated assessment literature make changes to these aspects of the models challenging. At the same time, the science of climate change (including research on socio-economic impacts) is moving rapidly. The federal government is committed to exploring how modeling frameworks can be improved so the latest research on impacts and damages are better represented in policy and regulatory analyses and has set a preliminary goal of revisiting the SCC values within two years.

The contractor is asked to provide a report summarizing the presentations and discussions occurring at the recent EPA/DOE Workshop on Improving Assessment and Valuation of Climate Change Impacts for Policy and Regulatory Analysis.

II. PURPOSE AND OBJECTIVE:

In Contract No. EP-W-08-018 Work Assignment No. 2-5, the contractor provided meeting development and facilitation services to help organize a workshop where experts discussed the assessment of climate change damages for policy and regulatory analysis, with a particular focus on climate change integrated assessment modeling and related research. One goal of the workshop was to catalyze peer-reviewed literature and improvements in modeling capabilities that can directly inform near-term analyses, including the next round of interagency SCC discussions. A second goal was to identify and prioritize longer-term research that will advance the USG's ability to incorporate information about climate change impacts into policy and regulatory analyses.

The workshop included two parts:

- 1) Review of existing IAMs and discussion of conceptual issues involved in improving the estimation of climate damages for policy analysis, and
- 2) Constructive audit of existing empirical research on climate change impacts and damages aimed at refining the current representation of these effects in IAMs and motivating new research to fill critical gaps.

In this work assignment, the contractor shall summarize the presentations and discussions occurring at part II of the workshop (January 27-28, 2011) in a report to EPA and shall provide an executive summary of highlights and recommendations from both Parts I and II. Following technical direction from the WAM, the contractor shall also help facilitate the publication of select papers from both parts in a peer-reviewed journal.

III. QUALITY ASSURANCE (QA) REQUIREMENTS

The Contractor shall submit with their technical proposal a written Quality Assurance Project Plan for any project that is developing environmental measurements or a Quality Assurance Supplement to the Quality Management Plan for any project which generates environmental data using models.

IV. TASKS AND DELIVERABLES:

The WAM will review all deliverables in draft form and provide revisions and/or comments to the contractor. The contractor shall prepare the final deliverables incorporating the WAM's comments. Contractor shall provide the WAM with both electronic and hard copy versions of all deliverables.

Contractor personnel shall at all times identify themselves as Contractor employees and shall not present themselves as EPA employees. Furthermore, they shall not represent the views of the U.S. Government, EPA, or its employees. In addition, the Contractor shall not engage in inherently governmental activities, including but not limited to actual determination of EPA policy and preparation of documents on EPA letterhead.

Task 1: Prepare Work Plan

The contractor shall prepare a work plan in accordance with the terms of the contract. The work plan shall outline and describe the approach that will be taken for finalizing the workshop part II report and the executive summary. The plan shall also include the timeline and due dates for deliverables, as well as a detailed cost estimate by task and a staffing plan. The contractor shall prepare a revised work plan incorporating the if required.

Deliverables and Schedule for Task 1:

- 1a.** Work Plan and Cost Estimate in accordance with the terms of the contract
- 1b.** Revised Work Plan and Cost Estimate, if required, in accordance with the terms of the contract.

Task 2: Write Summary Report

The contractor shall prepare a summary report of the January workshop and a brief executive summary report of both the November and January workshops. The January workshop report shall include summaries of the presentations on the agenda and discussions throughout the workshop, including any question and answer sessions. The executive summary report of both workshops shall try to synthesize any recommendations made by the workshop participants highlighting future research needs and next steps.

Deliverables and Schedule for Task 2:

- 2a.** Submit draft of January workshop summary report within 1 week of completing 1b.
- 2b.** Submit final summary report of January workshop within 2 weeks of receiving comments from the WAM on 2a.
- 2c.** Submit draft executive summary 4 weeks after receiving comments from WAM on 2a.
- 2d.** Submit final executive summary within 1 week of receiving comments from WAM on 2c.

Task 3: Publication of select workshop papers (Contract Reference: Page 11 #23)

Upon receiving technical direction from the WAM, the contractor shall help to organize the publication of select papers from both workshops (e.g., in a special issue of *Climatic Change* or other interdisciplinary journal).

Deliverables and Schedule for Task 3:

3a. Secure a commitment from the selected journal after receiving technical direction from the WAM.

3b. Upon receiving technical direction from WAM, correspond with authors to develop final papers, format them according to the journal guidelines, and submit them to the journal for review.

V. SCHEDULE FOR DELIVERABLES:

The contractor shall provide the following specific deliverables to the EPA WAM:

	DELIVERABLE	FORM AND QUANTITY	SCHEDULE
Task 1:	1a. Work Plan	Electronic	In accordance with the terms of the contract.
	1b. Revised Work Plan, if required.	Electronic	In accordance with the terms of the contract.
Task 2:	2a. Draft January Workshop Summary Report	Electronic	Within 1 month of receipt of work assignment.
	2b. Final January Workshop Summary Report	Electronic	Within 2 weeks of receiving comments from the WAM on 2a.
	2c. Draft Executive Summary	Electronic	Within 4 weeks of receiving comments from WAM on 2a.
	2d. Final Executive Summary	Electronic	Within 1 week of receiving comment from WAM on 2c.
Task 3:	3a. Commitment from selected journal	Electronic	As soon as possible after receiving technical direction from WAM.
	3b. Submit final papers to selected journal	Electronic	As soon as possible after completion of the workshop and according to timeline agreed to with journal

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number
3-5☐ Original ☒ Amendment Number: 1Contract Number
EP-W-08-018Contract Period
Base Option Period Number IIITitle of Work Assignment
Summary Report of Workshop on Improving
Assessment and Valuation of Climate Change
Impacts for Policy and Regulatory AnalysisContractor
ICF SERVICES COMPANY, L.L.C.

Specify Section and Paragraph of Contract SOW

Purpose: ☐ Work Assignment Initiation ☐ Work Assignment Close-Out
☒ Work Assignment Amendment ☐ Incremental Funding
☒ Work Plan Approval

Periods of Performance

From: 03/11/11

To: 06/30/11

Comments:

The purpose of this amendment is to approve the contractor's work plan and cost estimate dated April 14, 2011.

☐ Superfund

Accounting and Appropriations Data

☒ Non-Superfund

Line	DC (Max 6)	Budget/FYs (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class	Amount	(Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code (Max 7)
1											
2											
3											
4											
5											

Authorized Work Assignment Ceiling

Contract Period: 3/11/08 to 3/10/12

Cost/Fee

LOE

Previously Approved

\$0.00

220

This Action

\$28,173.00

(18)

Total

\$28,173.00

202

Work Plan / Cost Estimate Approvals

Contractor WP Dated : 04/14/11

Cost/Fee: \$28,173.00

LOE: 202

Cumulative Approved: 04/14/11

Cost/Fee: \$28,173.00

LOE: 202

Work Assignment Manager Name

ANDREW P. MANALE

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Project Officer Name

RYAN T. DANIELS

Branch/Mail Code

Phone Number

Fax Number

(Signature)

(Date)

Other Agency Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contracting Official Name

DEBRA A. MILLER

Branch/Mail Code 3803R

Phone Number 202-564-1041

Fax Number

(Signature)

(Date)

Contractor Acknowledgement of Receipt and Approval of Workplan (Signature and Title)

Date